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When Managers Change Their Tone, Analysts and Investors Change Their Tune*

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Abstract

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Keywords: Analysts, earnings conference calls, managerial tone, negative words, bleak tone, tone changes, price drift, textual analysis

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Effective analysts and investors distill information from whatever sources are available. Quarterly earnings releases receive detailed attention from market participants. Firm managers typically hold an earnings conference call to accompany such releases. On the call, they present the results and answer questions from financial analysts. What can analysts and investors infer from managerial communication on these calls? And what do they infer in fact?

Detailed analyses of 100,000 conference calls that accompanied earnings releases from 2003 to 2016 show that increases in managerial negativity, what we term *bleak tone changes*, strongly predict lower future earnings and greater uncertainty. That is true after controlling for information in the earnings press release and various other factors. Analysts adjust their earnings forecasts in response to bleak changes, and market prices move. However, their responses are insufficient. Hence, a profitable negativity-based trading strategy is available. *Bright tone change*s, decreases in negativity, predict positive changes, but only weakly.

Linguistic tone and vocal cues during the earnings conference call engender stock market reactions (e.g., Mayew and Venkatachalam 2012; Price et al. 2012; Brockman et al. 2015).[1] Investors who want to incorporate measures of tone into their investment choices will want to know why. What drives the short-term market reaction to conference call tone? Does managerial tone convey value-relevant news about cash-flows or discount rates? Or does it reflect sentiment or tactics that fool the market? The prior literature provides no satisfactory answers to these questions.

Prior studies on tone in conference calls that find links between that tone and earnings and uncertainty do not control for characteristics of the earnings press release and analysts' questions during the call. Absent such controls, it is not possible to know what information is added by *managerial* tone on conference calls.[2]

If one casts a wider net and considers those studies that jointly study the predictive power of other corporate communications for earnings and stock returns, one finds varying conclusions. Some results indicate that managers signal value-relevant information with their tone in earnings press releases. Others conclude to the contrary that managers mislead the market with such releases.[3] We make no attempt to resolve these contradictory findings. However, we do infer that

[1]See Li (2011), Henry and Leone (2016) and Loughran and McDonald (2016) for surveys.

[2]For example, in his investigation of managerial spontaneity on conference calls, Lee (2016) includes net positivity of the overall conference call (managers and analysts together) as a control variable. It turns out that this variable is associated with higher future earnings, higher analyst forecasts and lower bid-ask spreads. However, his analysis does not consider the tone of the earnings press release.

[3]Some studies show that changes in positivity in earnings press releases predict higher returns on assets (Davis et al. 2012), and where future returns are harder to assess, this effect is stronger (Demers and Vega 2010). By

to understand whether managerial tone in conference calls conveys value-relevant information, one must jointly investigate stock returns together with their drivers, earnings and uncertainty. Moreover, one must examine analyst forecast revisions, all the while controlling for the tone of the earnings press release and analysts' questions.

The literature's major results identifying stock price reactions to linguistic tone were established a while ago. In particular, Mayew and Venkatachalam (2012) study conference calls in the year 2007, and Price et al. (2012) and Brockman et al. (2015) cover the years 2004-2007. Do these results still hold in a more current sample? In a pattern of coevolution, the behaviors of managers and the market may respond to discoveries in the finance literature, just as the literature responds to those behaviors. Another new factor has entered the system. In recent years, many executives have become active on social media (Chen et al. 2019). That may have made conference calls less relevant. Alternatively, the linguistic component on conference calls may be a fundamental characteristic of corporate communication, no less important today as it was a decade ago. These observations make it important to examine the role of linguistic tone in a contemporary sample.

We perform our tests in the context of earnings conference calls for companies with available transcripts from 2003 to 2016. Presentations and answers are considered separately. The analysis, following prior literature, focuses on *negativity changes*, measured as current quarter negativity minus prior quarter negativity. It entails two important features.

First, to determine how changes in managerial negativity convey incremental information, it controls for the traditional factors – quantitative earnings surprise, firm uncertainty and stock returns during the most recent quarter – but also in addition for the negativity changes in both the earnings press release and analysts' questions. These last two controls are critical for teasing out the additional information that *managerial* speech provides. Earlier studies had shown that stock market participants *do react* to conference calls (Frankel et al. 1999; Bowen et al. 2002; Bushee et al. 2003), indeed even during calls (Matsumoto et al. 2011). Our study seeks to shed light on *what drives* (e.g., cash-flow news, discount rate news or rather non-information driven managerial sentiment) stock market reactions. It also seeks to determine whether that reaction is too weak, too strong, or roughly appropriate.

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contrast, Huang et al. (2014) provide evidence that abnormally positive tone in earnings releases predicts lower earnings in the following years. The frequency of negative words in 10-K filings has been found to correlate positively with positive future earnings surprises (Loughran and McDonald 2011). Regarding uncertainty, there is more agreement. More favorable disclosures in 10-K and 10-Q filings are associated with less dispersion in analysts' estimates and lower stock volatility (Kothari et al. 2009 and Loughran and McDonald 2011).

Second, we examine asymmetric effects of upticks *(bleak change*s) and downticks (*bright tone changes)* in the negativity of tone. We expect an increase in a manager's negativity to carry value-relevant information (because the manager overcame the natural tendency to speak positively).

We find that negativity changes in conference calls significantly predict both future earnings and uncertainty. (Uncertainty is indicated by the standard deviation of analysts' post-call forecasts for earnings in the next quarter.) Bleak tone changes strongly predict both lower future earnings and higher uncertainty. By contrast, bright changes predict only weakly in the opposite direction. Our results clearly indicate that the negativity change in the presentations section of the call yields additional explanatory power beyond the negativity change in the earnings press release. These results refute the view that conference call presentations simply rephrase the information the press release contains. In addition, negativity changes in managers' answers yield information beyond such changes in the conference call presentation, earnings press release and analysts' questions. In short, analysts' questions obtain or extract additional value-relevant information from managers.

That information is available from managerial tone does not mean that it is received or responded to. How do analysts and the market respond? First, after managerial tone changes, sell-side analysts revise their forecasts for the next quarter. However, analysts respond less than fully to the information, i.e., they under-react. Moreover, in line with the results from our earnings and uncertainty regressions, analysts adjust their estimates more strongly to bleak tone changes than to bright tone changes. Second, the market reacts negatively to bleak tone news. But the market too under-reacts. Thus, stock price movements tend to persist in their initial direction. This behavior is consistent with the incomplete adjustment by analysts.

A calendar-time portfolio strategy that exploits the price drift to managerial negativity changes, generates risk-adjusted returns around 0.3% per month. Our contributions in this context are to (1) document the economic magnitude of systematic under-reaction to tone within a large, recent cross-section of stocks and (2) to demonstrate that the overall drift is driven primarily by initial under-reaction to bleak changes. For practical purposes, these findings are mostly relevant for portfolios that are able to underweight stocks with bleak changes relative to an index. The tone-changes trading strategy performs more strongly for stocks where lesser price efficiency is expected, such as for firms with less institutional ownership or fewer analysts. Additional results and robustness checks are relegated to the Supplementary Online Appendix (SOA).

In short, our major result is that well beyond other available information bleak tone changes portend bad developments, but neither analysts nor the market recognize how bad.

1 Reading Managerial Tone

Management has numerous ways to communicate with the market. This analysis focuses on earnings conference calls. Three questions arise at the outset: Why (and to whom) might conference calls provide *additional* useful information beyond what is already known at the time of the call? Which parts of conference calls should investors and analysts attend to most closely? And which features of the call merit attention?

First, it is hardly obvious ex ante that conference calls should yield additional information, over and above the content of the earnings press release. In theory, such releases might well reveal all that management wished to convey. That makes it critical to control for their tone.[4]

We hardly posit that all analysts, much less all market participants, follow conference calls. In fact, it is likely that some market participants will be oriented to processing value-relevant information (if any) from conference calls, while others will focus on other sources of information regarding the fundamental value of a firm.

Second, conference calls have two components: first prepared remarks by management, second a more spontaneous section when managers respond to questions from analysts. Managers presumably pursue multiple objectives on conference calls, including promoting the firm and its valuation, establishing and safeguarding credibility, avoiding litigation for misleading or insufficiently informing investors, and addressing challenges brought by investors or other stakeholders. This must be done while avoiding the release of confidential information.

Should prepared or impromptu remarks by management on conference calls reveal more? First principles do not tell us. Prepared remarks provide a more confident way to convey the intended message appropriately. Managers can, of course, and do also prepare answers to likely questions. However, some answers get garbled, some questions come as a surprise, and some managers do not prepare effectively. Thus, when answering managers may reveal some information they wish they hadn't, much the way witnesses in a trial might inadvertently reveal information under cross examination. Finally, a manager may wish to communicate some items of information in a non-purposeful manner, thus keep them apart from the prepared remarks. Providing information in response to a question preserves seemliness and plausible deniability on intent. Prepared answers

[4]Similarly, Matsumoto et al. (2011) control for the market reaction during the press release in order to be able to document that the earnings call provides incremental information (as measured by the absolute abnormal return during the call). By considering firms that announced earnings after trading hours and held a conference call during the next business day, Brochet et al. (2018) are able to document that additional information relevant for non-announcing industry peers is contained in the conference call. Our interest here is in seeing whether linguistic tone of the call remains informative once one has controlled for the corresponding feature in the press release.

to likely questions can be used to provide indirect tips. Empirics, not theory, will reveal which parts of the conference call powerfully predict firm fundamentals, and thus presumably elicit stock price reactions. We therefore analyze presentations and answers separately, and also separate answers from analyst questions. In addition to managerial tone, tone in analysts questions can be informative (see, e.g., Chen et al. 2018). To extract the incremental information content of managerial negativity changes, we therefore control for the negativity change in analysts' questions.

The third question is which characteristics of the conference call, if any, investors (and analysts) should pay attention to. The literature has used linguistic tone (the relative frequency of negative and positive words), and that is the measure that we employ.[5] Why might this crude variable be useful? When a materially negative outlook is conveyed, for example, it is likely to be accompanied by the use of negative words, but analysts and investors may simply react to concrete numbers (e.g., decreased operating margins) by inputting them into their valuation spreadsheets. The point here is that "tone" provides a potential way to infer management's additional information. Counting negative and positive words as an indicator hardly means that tone will be the most informative indicator. Once machine-learning and artificial intelligence advance sufficiently, we expect extensive details of the call to be examined.[6] This study should serve as a precursor to more sophisticated analyses that lie in the future, and to see whether a simple approach yields informative results.

We expect bleak changes to predict more strongly than bright changes. First, significant constraints presumably operate to keep managers from boosting their negativity. That is, there are some things management should not or would prefer not to say about negative news, but which it could say comfortably about comparably positive news. Second, managers may accord with the widely observed findings of prospect theory (Kahneman and Tversky 1979). That theory posits that individuals employ reference points from recent experience. In our speech context, for managers, that would be how negative they were the prior quarter. Loss aversion is a primary

[5]Conference calls have allowed researchers to study strategic casting of analyst questions (Mayew, 2008; Cohen et al., 2013), evasive tactics of managers (Hollander et al., 2010; Gow et al., 2019), vocal dissonance (Hobson et al., 2012), deception words (Larcker and Zakolyukina, 2012), analyst questions and information acquisition (Mayew et al., 2013), communication patterns within the management team (Li et al., 2014), short-selling (Blau et al., 2015), managerial time horizons (Brochet et al., 2015), language barriers between managers and call listeners (Brochet et al., 2016), industry window dressing (Chen et al., 2016), contrastive words (Palmon et al., 2016), extreme language (Suslava, 2017), euphemistic language (Bochkay et al., 2019), humor (Call et al., 2019), vague talk (Dzieliński et al., 2019), managerial extraversion (Green et al., 2019), and intangibles talk (Filipović and Wagner, 2019).

[6]Frankel et al. (2018) compare several machine-learning techniques as well as (overall) conference call tone and conclude that these techniques capture a fraction of narrative content that a sophisticated reader would gather from a disclosure.

component of prospect theory. It observes that payoffs in the loss domain count two to three times as much as payoffs in the gain domain. Presumably, an increase in negativity (a bleak change) would be perceived as a loss, in contrast to the gain represented by a bright change. If so, it will take more news to induce managers to speak with a bleak change than with a bright change. However, alternative theories, such as litigation risk aversion could explain why bright tone changes would be more informative.[7] In short, it remains an empirical question as to whether bleak or bright changes will be more telling.[8] Also, empirics will show whether analysts and the market understand how bleak and bright changes might differ in their information content.

2 Methods and data

2.1 Methods

We have two main goals: to examine the relationship between conference call negativity changes and proxies for firm fundamentals, and to determine how negativity changes affect analysts' and investors' expectations. To pursue these goals, we run regressions of earnings, uncertainty, analyst forecast revisions and forecast errors, as well as stock returns on different tone measures and controls. The explanatory variables in all regressions are standardized to have a zero mean and a standard deviation of one. This facilitates an immediate comparison of the relative economic effects of different variables. We estimate panel regressions with firm, industry and quarter fixed effects. To account for autocorrelation in the error terms, we cluster standard errors at the firm level.[9]

In an additional analysis, we examine monthly calendar-time portfolio strategies which are constructed to exploit any investor under-reaction to managerial tone. These strategies allow us to quantify the magnitude of investor returns from our findings, while avoiding look-ahead bias.

We next describe our data and the main variables of interest.

[7]Managers are eager to avoid litigation risk. Thus, they may be inclined to downplay positive news and to quickly convey negative news. In that case, they would only speak more positively when their signal is highly informative. That in turn would make bright tone changes more telling. An additional factor may be that given that managers are reluctant to voluntarily disclose bad news (e.g., due to the risk of being fired) but are eager to reveal good news (e.g., to increase reputation), whenever their negativity takes an uptick, their word choice may be mostly due to non-fundamentally relevant factors (e.g., their mood), rather than value-relevant information. If so, bleak tone changes would carry little information; bright tone changes would be more informative.

[8]Prior literature examines the relative importance of the frequency of negative words vs. the frequency of positive words. However, these findings do not necessarily imply that increases in negativity are more informative than decreases in negativity. See Section 2.3 for details.

[9]The Supplementary Online Appendix (SOA) shows that the results are robust to using industry-quarter or CEO fixed effects instead, as well as to clustering standard errors by firm and by quarter. We also show that the results hold with Fama-MacBeth (Fama and MacBeth 1973) regressions with industry fixed-effects.

2.2 Sample

We draw data from multiple sources. We obtain conference call transcripts from Thompson Reuters Streetevents. We use analyst forecast data from Institutional Brokers' Estimate System (IBES), company fundamentals from Compustat and price data from Center for Research in Security Prices (CRSP). Our sample includes all U.S. common stocks traded on the NYSE, Amex or Nasdaq for whom earnings conference call transcripts and analyst data are available. The sample period is from 2003 to 2016, where the beginning of the sample was determined by the availability of conference call transcripts. We extract earnings press releases from firms' 8K filings, which we download via SEC's EDGAR system.[10]

All variables displayed in the tables in the main text are defined in Table A-1 in the Appendix. Definitions of variables that serve as additional controls and summary statistics of all variables are in the Supplementary Online Appendix (SOA).

2.3 Variables and Summary Statistics

Measuring tone of speech and tone of press releases. We identify managerial speech characteristics through written transcripts of conference calls. To capture tone, we use the word lists compiled by Loughran and McDonald (2011). Those lists contain 2,329 negative, 354 positive, and 297 uncertain words.[11]

Different individuals speak on the conference call. The CEO usually speaks around half of the time. (Li et al. (2014) analyze who speaks when on conference calls.) Our main analysis considers the tone of all management members jointly, and usually refers to these members collectively as the *manager*. The results prove similar if we compute our tone measures using only CEO speech.

Our focus is on what managers say. We compute our negativity indicators separately for the manager's prepared presentation and for the manager's answers, as these parts are fundamentally different. Questions from knowledgeable analysts may also be informative, and we therefore investigate their negativity as well.

$Negativity_{jt}$ measures the tone of managers or analysts of company j in the conference call of quarter t. It is defined as

$$negativity_{jt} = \frac{negative\ words_{jt} - positive\ words_{jt}}{negative\ words_{jt} + positive\ words_{jt} + 1}. \tag{1a}$$

This net negativity measure has also been used in prior studies (see, e.g., Price et al. 2012; Henry

[10] In line with Loughran and McDonald (2011), we use the Wharton Research Data Services (WRDS) CIK file to link the SEC's CIK identifier to our CRSP/Compustat/IBES merged sample.

[11] We use the 2017 version from http://www3.nd.edu/~mcdonald/Word_Lists.html.

and Leone 2016). As an alternative, we also compute negativity as the ratio of negative words to total words, i.e.,

$$negativity\ (alt)_{jt} = \frac{negative\ words_{jt}}{total\ words_{jt}}. \tag{1b}$$

The negative word frequency measure in eq. (1b) ignores positive words, which brings both advantages and disadvantages.

On the one hand, positive words are more ambiguous than negative words because negation mostly occurs with positive words and it is difficult to capture all negations (see Loughran and McDonald 2016). This may help explain the findings in Tetlock (2007) and Tetlock et al. (2008), who, for a sample of media articles, document that negative words are more informative than positive words. Thus, the results of the prior literature do not necessarily imply that increases in negativity are more informative than decreases in negativity.

On the other hand, the ratio of negative to total words ignores the fact that a manager may just use more negative *and* positive words overall. The measure of negativity in eq. (1a) thus accounts for the total number of "sentiment" words, i.e., both positive and negative words, a manager uses. In the main text, we present all results using net negativity, eq. (1a). However, we also check whether the results hold if we employ eq. (1b) as our measure of negativity (see the SOA). Note that using the measure in eq. (1b), bright tone changes (downticks in negativity) only occur when managers use fewer negative words, but using the definition in eq. (1a) such changes can also be driven by an increase in the number of positive words. Therefore, comparing the results for the two measures enables us to test whether information content rather than estimation noise (due to the difficulty of accurately adjusting for negation of positive words) explains the differences in the relative predictive power of bleak tone changes (upticks in negativity) and bright tone changes (downticks in negativity) that we document.

Where we use positive words, we exercise care to correct for negation, by excluding a positive word from the count when a negation word ("no", "not", "none", "neither", "never", "nobody", "*n't") occurs among the three words preceding it (except when a comma or a period appears in that range). In addition, as noted by Allee and DeAngelis (2015), certain words should not be counted if followed by other specific words. These words are: "good" (e.g., "good morning"), "effective" (e.g., "effective income"), "efficiency" (e.g., "efficiency ratio"), and "closing" (e.g., "closing remarks"). We, therefore, apply the Allee and DeAngelis (2015) screens for these "special" words.[12]

[12]See the discussion in the SOA of whether the words "question" and "questions" should be excluded from the negative word list. Though kept here, excluding them does not affect our results.

We code *negativity in earnings press release* to serve as a control variable. Whatever negativity measure we use for conference calls, whether eq. (1a) or eq. (1b), we use as well for the press release. Even though both the earnings press release and the conference call presentation are carefully scripted, the correlation of negativity in the two corpuses is fairly low (0.41 when using net negativity and 0.46 when using negative word frequency), and the correlation between the quarter-to-quarter changes in both variables is even lower (0.27 and 0.28, respectively). This fact alone makes it likely that conference call presentations provide incremental information beyond what is already known from the press release.

The average negativity values are -0.31 and -0.24 for presentations and answers, respectively. That values are negative is not surprising, because managers are arguably naturally inclined to use more positive than negative words. The disparity between presentations and answers may reflect the tendency of CEOs to buff up assessments in presentations, perhaps because they think they can do so more judiciously in prepared remarks. However, a major factor tilting answers toward negativity is likely the negative cast of analysts' questions (average negativity of +0.12). Indeed, the correlation between negativity changes in analysts' questions and negativity changes in managerial answers is positive and higher than the correlation between negativity changes in analysts' questions and negativity changes in presentations (0.23 vs. 0.12). Analysts' strong negative tilt suggests that they differentially ask about concerns, sometimes about the validity of the remarks made in the formal presentations, and more generally about the company's past performance and future prospects.

Negativity changes, bleak tone changes, and bright tone changes. Some managers may be generally more positive than others (see, e.g., Davis et al. 2015), and the market likely builds expectations about the tone of particular managers. Thus, we would expect that innovations in negativity provide a stronger signal. Therefore, we focus on *negativity change*:

$$negativity\ change_{jt} = negativity_{jt} - negativity_{jt-1}, \tag{2}$$

where t indicates the quarter. Demers and Vega (2010), Feldman et al. (2010), Davis et al. (2012) and Henry and Leone (2016) also focus on tone changes.

We isolate the incremental information conveyed by negativity changes by controlling for a series of firm and tone characteristics. An alternative, also intuitive approach is to first compute abnormal negativity, derived as the residual from auxiliary first-pass regressions of tone on past tone and firm characteristics, and then use that measure in the main regressions. Results available on request show that we obtain similar findings using this approach. Employing changes

brings several advantages relative to the abnormal tone approach. First, a change measure removes systematic firm-specific misclassifications of words (see Feldman et al. 2010 and Loughran and McDonald 2016). Second, using a change measure is non-parametric, whereas the abnormal tone approach relies on the functional form in the first-pass regression. Third, importantly from a practical perspective, using a change measure avoids look-ahead bias, that is, it does not use information not available at the time of making investment decisions. This is particularly important when one examines how tone can be used in a trading strategy given the information available to analysts and investors at a certain point in time.

Denote negativity change by NC, with NC_P and NC_A denoting negativity changes in presentations and answers, respectively. Moreover, define $1\{NC > 0\}$ as an indicator variable that equals one if the corresponding negativity change is positive, and zero otherwise. Similarly, $1\{NC \leq 0\}$ is an indicator variable that equals one if the corresponding negativity change is negative, and zero otherwise. A *bleak tone change* (uptick in negativity) is defined as the absolute value of $NC_P * 1\{NC_P > 0\}$ for presentations and as the absolute value of $NC_A * 1\{NC_A > 0\}$ for answers. Analogously, a *bright tone change* (downtick in negativity) is the absolute value of $NC_P * 1\{NC_P \leq 0\}$ and the absolute value of $NC_A * 1\{NC_A \leq 0\}$ for presentations and answers, respectively.

To reduce the influence of outliers, we winsorize negativity changes at the 1st and 99th percent levels. Similarly, bleak changes and bright changes are winsorized at the 99th percent level.

Dependent variables. We have two principal interests on the implications of tone changes. 1. How do they predict company fundamentals? 2. How, if at all, do analysts and investors respond to tone changes? Thus, we will assess the relationship of tone changes with:

Earnings change in quarter $t+1$ is earnings in quarter $t+1$ minus earnings in the same quarter in the previous year, divided by the volatility of earnings changes over the prior 20 quarters. (This formulation follows, e.g., Bernard and Thomas (1989) and Tetlock et al. (2008).)

Post-call forecast dispersion is the standard deviation of analysts' forecasts for quarter $t+1$ earnings tallied three days after the conference call of quarter t, divided by the absolute value of the mean consensus earnings forecast outstanding three days after the conference call of quarter t, multiplied by 100.

Consensus forecast change is the change in analysts' mean consensus forecast for earnings in quarter $t+1$, from the day before the conference call to three days after the call, divided by the absolute value of earnings in quarter $t+1$, multiplied by 100.

Consensus forecast error is the difference between the post-conference call forecast (the consensus forecast for quarter $t+1$ outstanding 3 days after the conference call for quarter t) and the actual earnings in quarter $t+1$, divided by the absolute value of earnings in quarter $t+1$, multiplied by 100.

We calculate daily excess stock returns in percentages following Daniel et al. (1997) (DGTW). DGTW provide monthly portfolio returns. We apply their methodology to daily returns to compute DGTW characteristic-adjusted stock returns. *CAR[t,t+k]* is the cumulative DGTW-adjusted stock return from day t through day t+k, where t=0 on the conference call day. We compute both the two-day CAR[0,1] and the 59-day CAR[2,60].

We complement the daily DGTW returns with both monthly raw returns and monthly DGTW returns (which we calculate using the same procedure as the daily returns). These are the main dependent variables of interest in the calendar-time tests below.

To reduce the influence of outliers, we trim continuous dependent variables (standardized change in earnings, forecast change, forecast error, and the CARs) at the 1st and 99th percent levels. For post-call forecast dispersion, one-sided trimming is done at the 99th percent level. (Results prove similar if we winsorize instead.) Importantly, we do not trim the monthly raw and DGTW returns in the calendar-time tests.

Firm-level control variables. The regression specifications control for a series of variables that we expect to be related to changes in firm fundamentals, analyst reactions and/or stock returns. Specifically, they include the firm's earnings change in quarter t, mean surprise, size in quarter t, book-to-market in quarter t, stock return in quarter t, monthly volatility in quarter t, and pre-call forecast dispersion. All control variables are winsorized at the 1st and 99th percent levels, except for pre-call forecast dispersion, which is winsorized at the 99th percent level.

Additional examined characteristics of managerial speech. Several additional patterns of speech are expected to be value-relevant. Thus, they are included as additional explanatory variables.

The *length of a conference call* may indicate that a company has more explaining to do. Therefore, we control for log words in presentations, answers and analyst questions. *Inconsistency in tone* is the absolute difference in negativity between presentations (prepared speech) and answers (improvised speech). Inconsistency may indicate troubles ahead, but might also indicate that the manager's answers are particularly informative. We also code the use of *uncertain* and *strong modal* words or constructions, using the Loughran and McDonald (2011) classification. Uncertain

words may harm investors' ability to value a stock (in the spirit of Loughran and McDonald 2013). Modal words express levels of confidence. Examples of strong modal words include the words *always*, *definitely*, *never*, and *will*. (We do not analyze weak modal words separately because they are a subset of the uncertain word list.) We also include the frequency of *financial* words (as identified in Matsumoto et al. 2011) and the frequency of *numbers* (as suggested by Zhou 2018). As a measure of *complexity*, we calculate the number of words per sentence.[13]

Arguably, presentations should primarily announce and explain past results. Answers should clarify missed points, explain the current situation, or preview the future. In the SOA we show that, normally, around half of the phrases in presentations use the past tense, whereas close to two thirds of the phrases in answers use the present tense. The use of the future tense is relatively rare; fewer than 10% of the verbs used in any of presentations and answers use the future tense, though much present tense discussion is implicitly about the future. If sentences in a presentation use the past tense unusually little, the managers may be trying to divert attention from actual outcomes to potential future events. We define *atypical tense* as the weighted average percentage of the manager's verbs not in the past tense in the presentation and the manager's verbs not in the present or future tense in the answers, where the weights are the number of verbs in the two respective parts of the conference call.

We winsorize all these speech characteristics variables at the 1st and 99th percent levels.

3 Do Managerial Negativity Changes Predict Earnings and Uncertainty?

If managerial negativity changes help to predict earnings and uncertainty, stock market reactions to negativity changes in the appropriate direction would likely reflect rational information processing. We investigate the predictive power of managerial tone changes for earnings and uncertainty in this section. Analyst and stock market reactions are the subject of Sections 4 and 5.

3.1 Future Earnings

Do managers reveal information about future earnings of the company by choosing their tone, purposefully or inadvertently, in the conference call? If yes, negativity changes will predict earnings changes in the next quarter. Moreover, that will be true even after controlling for hard information

[13] Loughran and McDonald (2016) highlight that the parsing of business documents into sentences is error prone. This is a somewhat smaller danger in the context of conference calls, which, for example, do not contain tables. We pay special attention not to count decimal dots as sentence-ending periods. Several papers have studied the role of readability of corporate communications (Li 2008; Loughran and McDonald 2014).

such as the current quarter earnings surprise and negativity changes in the earnings press release.

[Insert Table 1 about here]

Our first main result is that negativity changes, beyond publicly available information, strongly predict future changes in earnings, as measured by next quarter's earnings minus those from the same quarter a year ago. Column (1) of Table 1 tells the tale. It shows that the negativity change in either presentations or answers relates negatively to future changes in earnings, even after controlling for relevant factors. Those factors are the negativity changes of the earnings press release and analysts' questions, current change in earnings, the earnings surprise, as well as a large set of other controls including firm, industry and quarter fixed effects.[14]

Next we separately investigate bleak tone changes (negativity upticks) and bright tone changes (negativity downticks). The results in columns (2) and (3) show that, as expected, bleak tone changes in presentations and/or answers strongly predict negative future earnings changes. The effects of bright tone changes are much weaker.

All these results obtain after controlling for the negativity change in the earnings press release and analyst questions, either of which also significantly predicts future earnings changes. Our SOA uses Fama-MacBeth regressions to re-estimate the specifications of columns (2) and (3) to allow the effect of tone changes to vary over time. As before, bleak tone changes predict earnings changes more strongly than bright tone changes.

In sum, when managers speak more negatively than they had previously, earnings tend to do worse after accounting for hard information contained in the earnings announcement and for the negativity changes of the press release and analysts' questions. Bleak tone changes predict more powerfully than bright tone changes.

3.2 Uncertainty

Greater uncertainty about a firm's future should drive up the discount rate that the market applies to those future earnings, and thus depress its stock price. Therefore, we are concerned with how the tone in a manager's speech impacts uncertainty following the conference call as proxied by how dispersed analysts are in their estimates right after the call.[15]

[14]The results for the control variables are not shown to conserve space, but are included in the full tables in the SOA. When managers use more uncertain words, more strong modal words, and more complex sentences, future earnings drop on average. The frequency of numbers is positively associated with future changes in earnings (albeit the coefficient is noisy).

[15]Higher analyst uncertainty may reflect both higher systematic and idiosyncratic risk. Even idiosyncratic risk may be priced, i.e., may affect discount rates when investors are not fully diversified (see, e.g., Merton 1987).

Columns (4) to (6) of Table 1 show that bleak changes predict greater dispersion of forecasts regarding the next quarter, measured within three days after the conference call. By contrast, bright tone changes either do not significantly predict uncertainty (when comparing negativity with the prior quarter, as in Table 1), or they predict a decrease in uncertainty, but with a much smaller absolute effect than bleak tone changes (when taking into account information from the past four quarters in the computation of negativity changes, see the SOA).

In sum, if managers speak with increased negativity, greater uncertainty is around the corner.

4 Do Analysts Respond to Managerial Negativity Changes?

The stock market requires an avenue for getting informed about tone. No doubt some stock market investors simply listen to the conference call directly, and respond. For a much larger audience of investors, it is likely that sell-side analysts, the professionals allowed to ask questions on these calls, are the messengers who distill and deliver information from the call.[16] That is, analysts report on the tea leaves that managers scatter before them with their written and spoken words. Thus, in this section, we examine the analysts' response to managerial negativity changes.

[Insert Table 2 about here]

To be clear, we are not positing that analysts conduct the types of statistical analyses conducted here, or even that they comb through press releases and transcripts to count words. Rather, we conjecture that they listen and read carefully, and secure an impression as to whether the manager has spoken more or less negatively. If, in fact, analysts do respond, that would reveal that at least some informal such process is at work. No doubt, some technologically sophisticated analysts do more, and machine learning is sure to enhance such processes in the future.

The results in Table 2 make clear that analysts do react to negativity changes in the appropriate direction, namely the direction that those changes imply for future earnings.[17] Thus, they adjust

[16]Based on data on investor requests for transcripts, Heinrichs et al. (2019) conclude that institutional investors do not necessarily "consume" conference calls, even if they hold large positions. Only analysts can ask questions. Although there is some participation by buy-side analysts (Jung et al. 2018), only 5% of questions are asked by these analysts.

[17]Managers, analysts, and investors interact in settings other than conference calls. Solomon and Soltes (2015) cite survey evidence showing that 97% of CEOs of publicly traded firms meet privately with investors. Private conversations of analysts and management are also frequent (Green et al. 2014; Soltes 2014). Even more intense interactions occur at longer analyst/investor days (Kirk and Markov 2016). Analysts sometimes hold private calls with management just after the public conference calls. Thus, analyst reports after conference calls often contain topics that were not discussed on the call (Huang et al. 2018). The result we document may thus arise in part from analysts following up with management to clarify why management spoke particularly positively or negatively, and thereby obtaining more specific information that enables them to support their forecast changes.

their forecasts downward when the manager speaks more negatively, even after controlling for observables (column (1)). Recall that the explanatory variables are standardized to have a zero mean and a standard deviation of one. The coefficient of -1.854 in column (1) implies that, on average, a one standard deviation increase in the negativity change in the presentation section of the conference call reduces the consensus earnings forecast for the next quarter by 1.85%, a sizable effect. Notably, these results obtain after controlling for the negativity change in the earnings press release and analysts' questions (both of which also have the expected negative sign), as well as for our rich set of other speech characteristics. Further, in line with the earnings predictability regressions, columns (2) and (3) show that analysts adjust absolutely more strongly following bleak tone changes than bright tone changes.

Do analysts' forecasts fully capture the tone of managers' speech? To answer that question, we relate errors in those forecasts to the magnitude of the managers' negativity changes. Column (4) of Table 2 shows that when managers talk more negatively in presentations and answers, forecast errors (expected earnings are above actual earnings) increase. Thus, analysts fail to fully incorporate all information from conference calls in their forecasts.[18] From column (5) it also becomes evident that analysts under-react more to bleak than to bright changes in presentations. With regards to answers, the results are mixed. A bright tone change appears stronger in the panel regressions (Table 2; column (6)) but weaker in the Fama-MacBeth regressions (reported in the SOA). In any case, the big difference in the coefficients of bleak changes and bright changes in the forecast change regressions still suggests a stronger overall bleak change effect for answers, as well as for presentations.[19]

In sum, the results on future earnings and earnings forecasts support the idea that managerial negativity changes convey information regarding future earnings, and that analysts incorporate that information. However, while their estimates respond notably, they do so insufficiently.

5 Do Investors Respond to Managerial Negativity Changes?

Given that analysts revise their forecasts upon managerial tone signals, and given that analysts under-react to changes in negativity, we would expect stock prices to respond in the same direction.

[18]This finding runs parallel to the result in Bradshaw et al. (2001) that analysts do not fully incorporate accruals into their earnings forecasts.

[19]The sum of the post-call forecast error and forecast change is equal to the pre-call forecast error. Thus, the sum of the respective coefficients reflects the effect of negativity changes on the pre-call forecast error. A larger effect suggests stronger informativeness for future earnings, not yet reflected in analysts' expectations prior to the call. As can be seen from Table 2, this sum is always larger for bleak changes.

Presumably, stock market participants should be able to distill information from the negativity of conference calls, either directly or with the assistance from analysts, implying that stock prices would move accordingly. However, it is unclear whether they would do so in a timely manner, and there would be even less expectation that they would correct for analyst under-reaction. We next seek to investigate these issues.

5.1 Immediate Stock Market Reactions

Columns (1) to (3) of Table 3 reveal the immediate stock market reaction to negativity changes. They regress CAR[0,1], the abnormal returns on the day of the conference call plus the immediately following day, on managerial negativity changes on the conference call.

[Insert Table 3 about here]

As a baseline, column (1) shows that negativity changes (in both presentations and answers) strongly negatively predict the short-term stock market reaction around the earnings announcement. This is consistent with prior studies (e.g., Mayew and Venkatachalam 2012; Price et al. 2012; Lee 2016).

Our novel results separate the effects of bright tone changes and bleak tone changes; see columns (2) and (3). The market's immediate response to bleak tone changes is far stronger than to bright tone changes, consistent with results above. For example, column (2) implies that a one standard deviation increase in bright tone changes in presentations leads to a short-run abnormal stock return of 0.34%. The equivalent bleak tone changes lead to a -0.55% abnormal return. Column (3) addresses answers, and shows similarly that bleak changes are much more powerful. All these findings apply after controlling for the negativity changes of the earnings press release and analysts' questions.

The full tables in the SOA show that the use of uncertain words, complex sentences, strong modal words and fewer numbers is associated with negative short-term stock reactions, as is the use of financial words. The share price also responds negatively to use of the wrong tense: management using the past tense in the answers part of the earnings call, and to talking in the present or future tense in the presentation part of the earnings call. Interestingly, when managers' presentations and answers are lengthy, the market seems to sense trouble ahead. All of these results are broadly consistent with findings for future earnings, analyst responses, and/or analyst uncertainty. For example, a higher fraction of uncertain words foreshadows lower future earnings, induces analysts to reduce their earnings forecasts, and predicts higher uncertainty.

[Insert Figure 1 about here]

Overall, conference call negativity changes robustly determine immediate stock price reactions. Figure 1 presents binned scatter plots connecting these results with the other results obtained so far. These plots show what bleak tone changes (left-hand side figures) and bright tone changes (right-hand side figures) in presentations portend for future earnings (top two figures), how analysts adjust their forecasts (second row), analyst uncertainty (third row), and how investors immediately respond (bottom two figures). The slopes in the figures on the left are much steeper than those on the right. That is, consistent with the results on earnings, earnings forecast changes, and uncertainty, the market's immediate response to bleak tone changes is much stronger than its response to bright tone changes.

5.2 Event-time Returns Beyond the Initial Market Response

What happens as the days and weeks pass after the conference calls? Of course, if the market efficiently prices in all information contained in managerial negativity changes, there will in principle be no relation between negativity changes and post-call returns. Alternatively, do return reversals result, as would happen if managerial statements were crafted to trick the market?[20] Finally, are there clear indications of return continuation, given that analysts under-estimated the news revealed by managerial speech patterns?

To investigate whether rational pricing, reversal, or continuation pertains, we analyze how stock prices behave in the quarter following a conference call. We use characteristics-adjusted excess returns (Daniel et al. 1997), which allows us to jointly control for size, value, and momentum in stock returns. Column (4) of Table 3 studies post-call drift in the trading days 2 to 60 after the conference call. Controlling for the earnings surprise, the negativity change in the earnings press release and all other controls employed above, we find that both negativity changes in presentations and answers on average negatively explain post-call cumulative returns, i.e., there is persistence in stock-price movements.[21]

[20] There might be some modest reversal over the medium term for another reason. As we have shown, bleak changes drive up uncertainty, and have the potential to increase the discount rate applied to the firm. Thus, firms whose price dipped in the short run can expect an increase in expected returns.

[21] Our results confirm the average post-call drift pattern presented in Price et al. (2012) for a pseudo-random sample of 2880 conference calls in the 2004-2007 period. In their event-time tests, Price et al. (2012) use size-adjusted returns as the dependent variable and then control for company variables, whereas our analysis uses the arguably "tougher" benchmark of characteristics-adjusted excess returns. We consider managers' answers and analyst questions separately, while Price et al. (2012) pool these two elements of the Q&A session. Brockman et al. (2015) emphasize the role of analyst tone in explaining stock-price drift. Henry and Leone (2016) present graphs illustrating return continuation after the initial positive reaction to positive tone changes in earnings press releases.

Moreover, columns (5) and (6) suggest that the drift in excess returns predicted by tone changes in presentations is stronger after bleak than bright tone changes. For answers, bleak tone changes predict no drift; bright changes predict some. Nevertheless, even for answers, bleak tone changes still explain more of the total effect, i.e., initial reaction plus drift. See the analysis of CAR[0,60] in the SOA. These findings are consistent with Hong et al. (2000), who find stronger price drifts following negative news. The authors suggest that one possible explanation for their results is that managers are unlikely to update investors with negative information quickly, and that this results in such information diffusing slowly in markets. However, importantly, we show that bleak tone changes actually do predict fundamentals (earnings and uncertainty) more strongly. Thus, our results suggest that it is not necessarily investors under-reacting more strongly to negative information that managers fail to communicate but it is rather managers' bleak talk being more informative than their bright talk.

In sum, even after controlling for the negativity change in the press release and for the earnings surprise, firms experiencing bleak changes on their conference calls under-perform the benchmark comprised of other firms with similar characteristics. Managerial tone conveys valuable and valued information. The drift that follows, however, indicates that the market slowly incorporates that information. From a practical investment perspective, the question now becomes whether the predictive ability of negativity changes can be exploited.

5.3 Calendar-time Tests

We start by constructing a calendar-time portfolio strategy to capture the lags in the incorporation of negativity changes into stock prices. Then, we examine the predictive power of tone changes utilizing a regression, so as to control for alternative sources of return predictability.[22]

Portfolio Strategy. At the beginning of each month, stocks are ranked into quintile portfolios based on their most recent quarter-to-quarter change in negativity. Stocks with a price at or below \$5 at portfolio formation are excluded; that assures that low-priced, illiquid stocks are not driving our results. For each of the five portfolios, equal-weighted excess returns (in excess of the 1-month

The drift results contrast with Huang et al. (2014), who examine earnings press releases from 1997 to 2007. Using raw returns (and controlling for firm characteristics), they identify reversions which they argue are consistent with manager's fooling the market.

[22]The majority of prior literature relies on event-time returns. In contrast to event-time returns, the calendar-time approach avoids problems such as cross-correlation and clustering of events, as well as look-ahead bias. The approach is, therefore, better suited to investigate the feasibility of abnormal returns and thus deviations from market efficiency. See, e.g., Mitchell and Stafford (2000).

T-bill rate) are computed over the subsequent month.[23] A portfolio that is long (short) stocks with low (high) negativity changes thus reflects the profits to systematic under-reaction to tone on conference calls.

[Insert Figure 2 about here]

Figure 2 summarizes the results. Monthly risk-adjusted returns (alphas) from the Carhart (1997) factor model decrease after a quarter-to-quarter boost in negativity. The long-short portfolio that is long (short) stocks with low (high) negativity changes generates monthly alphas of 0.31% and 0.26%, respectively, for presentations and answers. These alphas are highly statistically significant; the t-statistics are well above 3.[24] As shown in Table A-2 in the Appendix, excluding stocks in the lowest market capitalization tercile (of the sample) reduces the profitability of the long-short strategy. However, the returns remain, at least for presentations, statistically and economically significant. Finally, we also compute value-weighted portfolio returns, which are insignificant. The overall implication is that these results indicate that negativity changes are quickly incorporated into stock prices of the largest stocks in our sample.[25] However, profitability of the strategy is not limited to small capitalization stocks, which suggests that in practical terms, negativity changes in presentations and answers may well add to existing factor-based trading strategies, which have become prominent in recent years. Typically, such long-only strategies utilize characteristics (factors) to overweight stocks with favorable characteristics and underweight stocks with unfavorable characteristics. For example, momentum strategies overweight stocks with strong past performance and underweight stocks with weak past performance. In a similar vein, investors can benefit by underweighting positions in firms that exhibit upticks in negativity. While the positions in small firms make up, by definition, only a small fraction of the overall portfolio of an investor diversified in the market, positions in medium- and large-sized firms, can be more useful for this purpose.

Fama-MacBeth Regressions. To further examine the predictability of returns, we next estimate Fama-MacBeth regressions of monthly stock returns on the most recent quarter-to-quarter

[23]The risk-free rate, as well as the size, value, and momentum factors were downloaded from Kenneth French's website (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html).

[24]The results with DGTW returns are very similar. For presentations (answers) the monthly CH model alpha equals 0.29% (0.23%), whith all t-statistics being well above 3.

[25]In the SOA, we provide a more detailed examination of how proxies of information processing constraints such as size, analyst coverage and institutional ownership affect the profitability of the long-short strategy. We find that the returns to negativity changes in presentations and answers decrease with each of market capitalization, institutional ownership and analyst coverage.

changes in negativity and controls. To facilitate comparability with the event-time regression results, the main dependent variable of interest is the next month DGTW return. The results are similar if we use raw returns instead.

[Insert Table 4 about here]

Column (1) of Table 4 suggests that negativity changes in presentations help to significantly predict future characteristic-adjusted returns. Columns (2) and (3) show that, consistent with the event-time results, bleak tone changes predict more strongly than bright tone changes. The results obtain after controlling for size, value, book-to-market, momentum, and the most recent earnings surprise, as well as for negativity changes in the earnings press release and analyst questions, and for all remaining control variables from specification (6) of Table 3.[26]

In sum, calendar-time strategies involving conference call tone changes reap significant profits.[27] The negativity change in presentations proves to be a robust predictor of the cross-section of stock returns. Importantly, the effect is neither explained by the earnings surprise nor by tone changes in the earnings press release and analyst questions. Consistent with the event-time results, the negativity change in answers has predictive ability, too. However, compared to presentations, the negativity change in answers appears to be a less powerful predictor of future stock returns.

6 Additional Results

In the SOA we conduct a number of additional analyses. First, we show that bleak tone changes based on the negativity frequency ratio (i.e., negative words to total words, as per eq. (1b)) remain a stronger predictor of earnings and uncertainty as well as analysts' and investors' responses than are bright tone changes. These results strengthen our conclusion that positive and negative tone changes are inherently different in terms of information content. Second, we examine the role of media, managerial incentives and cross-sectional differences in tone informativeness across firms. Third, we perform an additional series of changes to our main specifications to check for robustness.

7 Conclusion

Successful analysts and investors are high-class sleuths, searching and distilling the information from clues, wherever they may be found. Most start by looking at objective numbers, but success requires much more. This analysis asked what information analysts and investors might glean

[26] The regressions include all remaining controls except for size and book-to-market in quarter t because these variables are already included at the monthly frequency instead.

[27] Note that we do not consider trading costs. The strategy is re-balanced monthly and the profits are concentrated in relatively smaller stocks. Thus, significant trading costs may deplete the strategy's profits.

from the managerial word choice in conference calls.

The finding, in short, is that analysts and investors already respond to such information. Specifically, they look to changes in managers' use of linguistic tone. When more negative tone is employed, analysts lower their earnings estimates. When less negative tone is employed, analysts raise their estimates to a lesser extent. First, kudos to these analysts; such managerial word choices prove to be tell-tales about future earnings, and in the right direction. And kudos to the market as well, because it too moves in the right direction in response to these subtle clues. But the kudos are limited. Both analysts and investors under respond. In short, there is drift after the initial response, and this drift can lead to profitable trading strategies. The alert reader will recognize that such under reaction is a cousin of the well known post-earnings announcement drift.

What lessons should analysts and investors take from our findings? First, they should have confidence that where currently they may be responding subtly, or even subconsciously, they are likely responding appropriately. Second, particularly given the vast dollars at stake, and the plummeting cost of capturing and processing information, they would do well to both automate some of their tea-leaf reading, and to test it on a statistical basis.

Third, this analysis is conducted when it is still dawn in the era of machine learning and artificial intelligence. In the coming years, almost certainly much more extensive analyses will be conducted of the hints that managers present to the investment community, either consciously or inadvertently, when they speak. This discussion should encourage analysts, and those who employ them, to push further into investigations of language and psychology.

If clues are to be distilled, it is important to look to the other side of the information market, to the managers. The presentations of managers accompanying conference calls are studiously prepared; their tone is carefully chosen. Their answers, though rehearsed for likely questions, must be somewhat impromptu. The estimates of analysts and the prices of stocks respond to the tone of the words managers employ, and in particular to the change in tone from the prior quarter, or the prior four quarters. Our analysis shows that the tone of these calls provides incremental information over and above the earnings press release and analysts' questions. It also provides conclusive evidence that bleak tone changes are much more informative than bright tone changes. These novel findings are informative. They are also suggestive that much more can be distilled from managerial speech than what was established in past literature.

There are lessons here too for managers. Many, no doubt, are aware that their tone conveys information. Many others may be naïve on this subject. But all should understand what messages

analysts and the market distill from tone, and see whether they might wish to adjust their speech patterns.

Investment markets in the past two decades have been kind to those who are experts in recognizing patterns in prices. The next two decades may reward individuals who are experts in uncovering clues in previously hard-to-discern places, including patterns in human speech, that massive data availability and near-costless processing have opened up for investigation.

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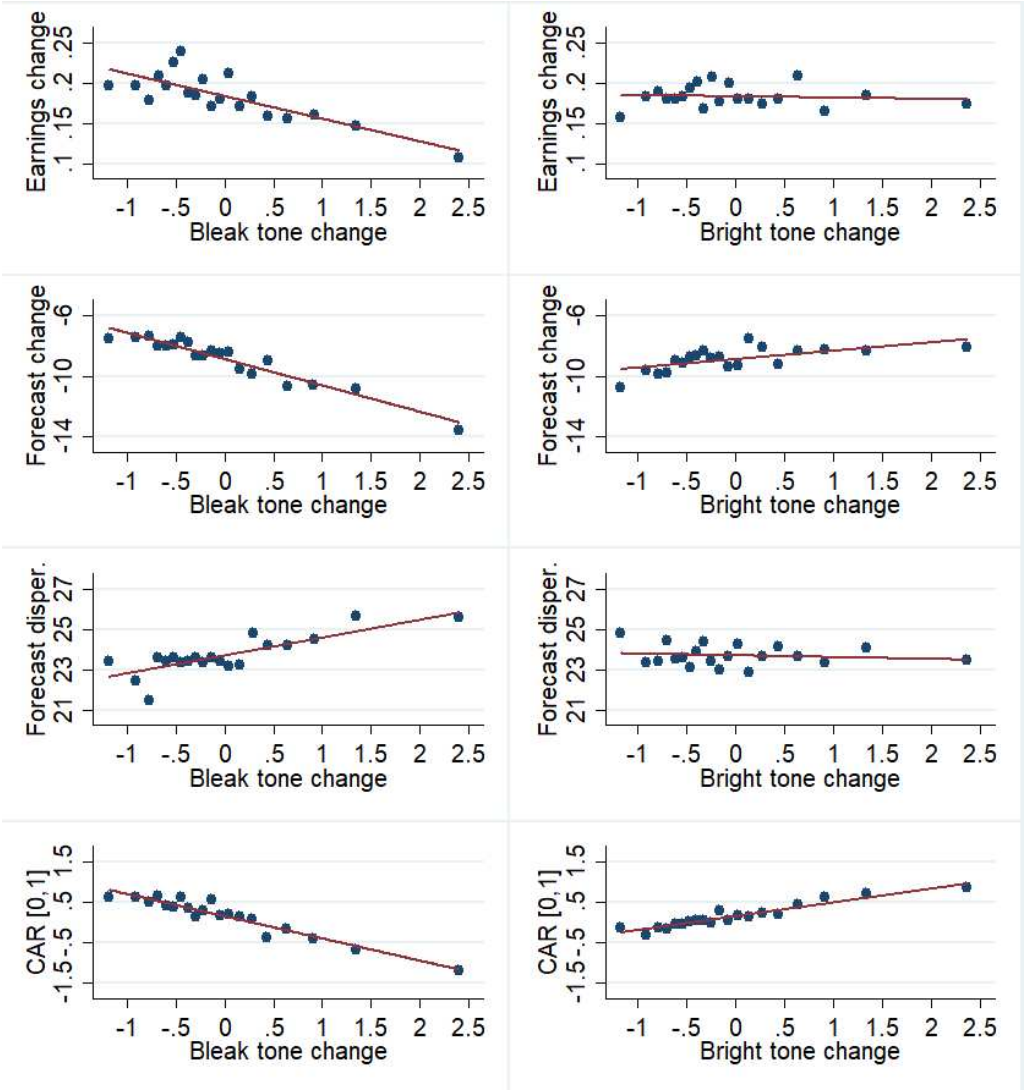
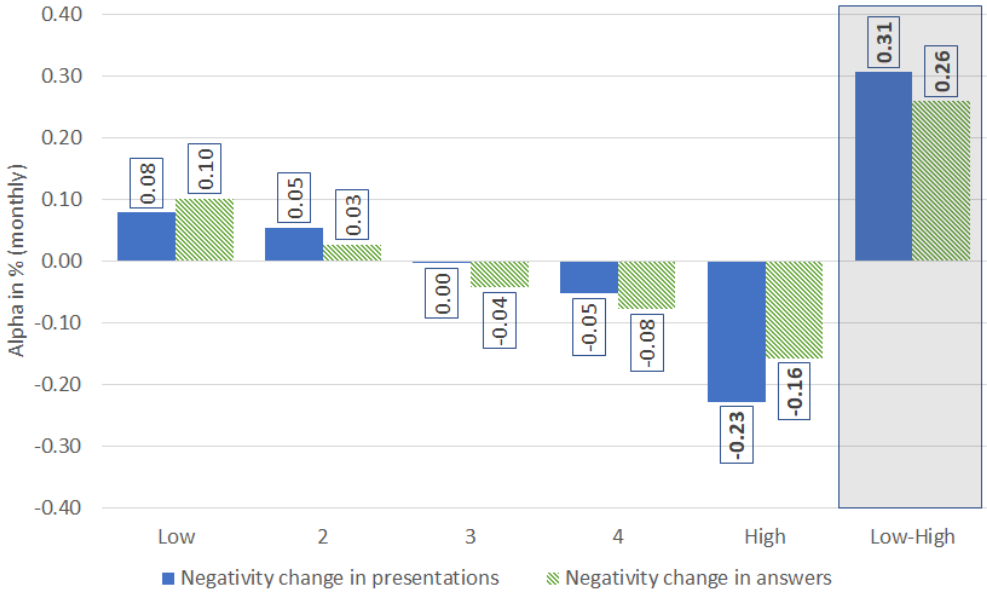
Figure 1. Responses to Bleak and Bright Tone Changes in Presentations: Earnings, Analyst Behavior & Stock Prices.



This figure presents binned scatter plots that illustrate the explanatory power of tone changes in presentations for future earnings, analyst forecast changes, forecast dispersion (indicator of uncertainty), and the immediate stock price reaction. The four figures in the left column concern bleak tone changes; the figures on the right concern bright tone changes. For each plot, all observations are sorted into 20 equal-sized bins of the explanatory variable. Each dot represents the average value within that bin of the variable on the vertical axis. The horizontal and vertical axes show residualized values, which explains why values on the horizontal axis can be negative. Specifically, all plots control for both the control variables and fixed effects used in Tables 1, 2, and 3.

Figure 2. Calendar-time Tests: Abnormal Returns to Negativity Changes.



This figure presents monthly calendar-time portfolio returns to a conference call trading strategy (2003:5-2016:7). In the beginning of each month stocks are ranked into quintile portfolios based on their most recent quarter-to-quarter change in negativity. Portfolio 1 (Low) contains stocks with the lowest negativity changes, whereas portfolio 5 (High) contains the stocks with the highest negativity changes. Low-High is the long-short strategy which is long portfolio 1 and short portfolio 5. The strategy is rebalanced monthly; stocks with beginning of month prices below \$5 are excluded. Alpha is the intercept from a time-series regression of monthly portfolio excess returns on the Carhart (1997) 4-factor model (CH). Numbers shown in bold indicate statistical significance at the 1% level. The underlying standard errors account for heteroskedasticity and autocorrelation up to 12 months.

Table 1. Do Managerial Negativity Changes Help to Predict Earnings and Uncertainty?

This table presents panel regressions (2003:Q2-2016:Q2). The dependent variable in columns (1) to (3) is the earnings change in quarter $t+1$. In columns (4) to (6), the dependent variable is the post-call forecast standard deviation of analysts' forecasts outstanding three days after the conference call. All variables shown in this table are defined in Table A-1. All specifications include further controls: earnings change in quarter t, earnings surprise, size in quarter t, book-to-market in quarter t, stock return in quarter t, monthly volatility in quarter t, pre-call forecast dispersion, ln(words in the presentation), ln(words in the answers), inconsistency in tone, % uncertain words, % strong modal words, % financial words, % atypical tense, complexity, % numbers in total words, firm-, quarter-, and industry fixed effects. These variables are defined in the Supplementary Online Appendix, which also presents the regression output displaying the coefficients on all controls. Industry fixed effects are based on the Fama-French 12 Industry classification. All explanatory variables are standardized to have a zero mean and a standard deviation of one. t-statistics are shown in parentheses. The underlying standard errors are clustered on the firm level and are robust to heteroskedasticity.

	Earnings Change in quarter $t+1$			Post-call Forecast Dispersion		
	(1)	(2)	(3)	(4)	(5)	(6)
Negativity change in presentations	-0.021			0.810		
	(-5.57)			(4.80)		
Negativity change in answers	-0.011			0.094		
	(-2.87)			(0.56)		
Bleak tone change in presentations		-0.028			0.886	
		(-6.85)			(4.66)	
Bright tone change in presentations		-0.001			-0.085	
		(-0.29)			(-0.49)	
Bleak tone change in answers			-0.019			0.443
			(-4.61)			(2.25)
Bright tone change in answers			-0.003			0.188
			(-0.74)			(1.02)
Negativity change in earnings press release	-0.012	-0.012	-0.017	0.261	0.259	0.445
	(-3.48)	(-3.51)	(-5.02)	(1.77)	(1.76)	(3.14)
Negativity change in analysts' questions	-0.005	-0.007	-0.007	0.078	0.095	0.137
	(-1.56)	(-2.17)	(-2.01)	(0.51)	(0.63)	(0.90)
Observations	70,997	70,997	70,997	71,714	71,714	71,714
R-squared	0.305	0.305	0.305	0.266	0.266	0.266

Table 2. Do Analysts Respond to Managerial Negativity Changes?

This table presents panel regressions (2003:Q2-2016:Q2). The dependent variable in columns (1) to (3) is the analyst consensus forecast change in percent of earnings in quarter $t+1$. In columns (4) to (6), the dependent variable is the analyst consensus forecast error in percent of earnings in quarter $t+1$. All variables shown in this table are defined in Table A-1. All specifications include further controls: earnings change in quarter t, earnings surprise, size in quarter t, book-to-market in quarter t, stock return in quarter t, monthly volatility in quarter t, pre-call forecast dispersion, ln(words in the presentation), ln(words in the answers), inconsistency in tone, % uncertain words, % strong modal words, % financial words, % atypical tense, complexity, % numbers in total words, firm-, quarter-, and industry fixed effects. These variables are defined in the Supplementary Online Appendix, which also presents the regression output displaying the coefficients on all controls. Industry fixed effects are based on the Fama-French 12 Industry classification. All explanatory variables are standardized to have a zero mean and a standard deviation of one. t-statistics are shown in parentheses. The underlying standard errors are clustered on the firm level and are robust to heteroskedasticity.

	Consensus Forecast Change			Consensus Forecast Error		
	(1)	(2)	(3)	(4)	(5)	(6)
Negativity change in presentations	-1.854			1.148		
	(-14.42)			(4.96)		
Negativity change in answers	-0.618			0.809		
	(-5.00)			(3.35)		
Bleak tone change in presentations		-1.744			0.930	
		(-11.41)			(3.35)	
Bright tone change in presentations		0.545			-0.559	
		(4.33)			(-2.23)	
Bleak tone change in answers			-0.821			0.352
			(-5.65)			(1.33)
Bright tone change in answers			0.216			-0.776
			(1.65)			(-3.02)
Negativity change in earnings press release	-0.752	-0.759	-1.179	0.656	0.672	0.925
	(-6.24)	(-6.30)	(-9.73)	(2.89)	(2.96)	(4.14)
Negativity change in analysts' questions	-0.929	-1.049	-1.069	0.509	0.667	0.600
	(-7.98)	(-9.05)	(-9.17)	(2.29)	(3.06)	(2.73)
Observations	70,850	70,850	70,850	70,801	70,801	70,801
R-squared	0.073	0.073	0.069	0.035	0.035	0.035

Table 3. Do Investors Respond to Managerial Negativity Changes?

This table presents panel regressions (2003:Q2-2016:Q2). The dependent variable in columns (1) to (3) is CAR[0,1], the two-day, [0,1] cumulative DGTW characteristic-adjusted stock return on and after the conference call date, in percent. In columns (4) to (6), the dependent variable is CAR[2,60], the 59 trading days [2,60] cumulative DGTW characteristic-adjusted stock return in percent from 2 days after the conference call date through the 60th day after that date. All variables shown in this table are defined in Table A-1. All specifications include further controls: earnings change in quarter t, earnings surprise, size in quarter t, book-to-market in quarter t, stock return in quarter t, monthly volatility in quarter t, pre-call forecast dispersion, ln(words in the presentation), ln(words in the answers), inconsistency in tone, % uncertain words, % strong modal words, % financial words, % atypical tense, complexity, % numbers in total words, firm-, quarter-, and industry fixed effects. These variables are defined in the Supplementary Online Appendix, which also presents the regression output displaying the coefficients on all controls. Industry fixed effects are based on the Fama-French 12 Industry classification. All explanatory variables are standardized to have a zero mean and a standard deviation of one. t-statistics are shown in parentheses. The underlying standard errors are clustered on the firm level and are robust to heteroskedasticity.

	CAR[0,1]			CAR[2,60]		
	(1)	(2)	(3)	(4)	(5)	(6)
Negativity change in presentations	-0.706			-0.100		
	(-24.28)			(-1.68)		
Negativity change in answers	-0.316			-0.107		
	(-11.56)			(-1.82)		
Bleak tone change in presentations		-0.548			-0.165	
		(-17.20)			(-2.49)	
Bright tone change in presentations		0.338			-0.029	
		(11.33)			(-0.47)	
Bleak tone change in answers			-0.438			-0.030
			(-13.92)			(-0.45)
Bright tone change in answers			0.057			0.110
			(1.94)			(1.68)
Negativity change in earnings press release	-0.299	-0.305	-0.461	-0.034	-0.035	-0.057
	(-11.25)	(-11.48)	(-17.34)	(-0.61)	(-0.64)	(-1.06)
Negativity change in analysts' questions	-0.638	-0.699	-0.690	-0.064	-0.085	-0.073
	(-23.64)	(-25.98)	(-25.39)	(-1.17)	(-1.56)	(-1.32)
Observations	70,521	70,521	70,521	70,617	70,617	70,617
R-squared	0.092	0.090	0.083	0.028	0.028	0.028

Table 4. Calendar-time Tests: Fama-MacBeth Regressions.

This table presents results from Fama-MacBeth regressions (2003:5-2016:7). The dependent variable in all specifications is the monthly DGTW characteristic-adjusted stock return in month $t+1$. For the explanatory variables we use the most recent value as at the beginning of month $t+1$. The table further includes size in month t, book-to-market in month t, momentum, return reversal, and all the remaining variables from specification (6) of Table 3, excluding size and book-to-market in quarter t. All variables shown are defined in Table A-1. All explanatory variables are standardized to have a zero mean and a standard deviation of one. The specifications include stocks with beginning of month prices above \$5. t-statistics, shown in parentheses, are based on standard errors accounting for heteroskedasticity and autocorrelation up to 12 months (Newey and West 1987).

	DGTW characteristic-adjusted stock return in month $t+1$		
	(1)	(2)	(3)
Negativity change in presentations	-0.035		
	(-1.93)		
Negativity change in answers	-0.055		
	(-2.76)		
Bleak tone change in presentations		-0.051	
		(-2.40)	
Bright tone change in presentations		-0.001	
		(-0.02)	
Bleak tone change in answers			-0.047
			(-1.88)
Bright tone change in answers			0.023
			(1.00)
Negativity change in earnings press release	-0.023	-0.023	-0.030
	(-1.08)	(-1.11)	(-1.41)
Negativity change in analysts' questions	-0.056	-0.069	-0.056
	(-3.33)	(-4.03)	(-3.44)
Avg. N	1'339	1'339	1'339
R-squared	0.025	0.072	0.072

Table A-1. Variable Definitions.

This table presents definitions of the main variables in the study. Definitions of all variables of the study are provided in the Supplementary Online Appendix.

Bleak tone change	Defined as the absolute value of $NC_P * \{NC_P > 0\}$ and absolute value of $NC_A * \{NC_A > 0\}$ for presentations and answers, respectively. $1\{NC > 0\}$ is an indicator variable which is equal to one if the corresponding negativity change is positive; it is zero if the negativity change is negative.	Authors' calculation
Bright tone change	Defined as the absolute value of $NC_P * 1\{NC_P \leq 0\}$ and absolute value of $NC_A * \{NC_A \leq 0\}$ for presentations and answers, respectively. $1\{NC \leq 0\}$ is an indicator variable which is equal to one if the corresponding negativity change is negative; it is zero if the negativity change is positive.	Authors' calculation
CAR[0,1]	The two-day, [0,1] cumulative Daniel et al. (1997) (DGTW) characteristic-adjusted stock return on and after the conference call date, in percent. DGTW characteristic-adjusted returns are defined as raw daily returns minus the returns on a portfolio of all CRSP common stocks in the same size, book-to-market, and 1-year momentum quintiles.	CRSP, WRDS, Authors' calculation
CAR[2,60]	The 59 trading days [2,60] cumulative DGTW characteristic-adjusted stock return in percent from 2 days after the conference call date through the 60th day after that date.	CRSP, WRDS, Authors' calculation
CAR[0,60]	The 61 trading days [0,60] cumulative DGTW characteristic-adjusted stock return in percent from the day of the conference call date through the 60th day after that date.	CRSP, WRDS, Authors' calculation
Consensus forecast change	The change in the analysts' consensus forecast for earnings in quarter $t+1$, from the day before the conference call to three days after the call, divided by the absolute earnings in quarter $t+1$, multiplied by 100.	IBES
Consensus forecast error	The difference between the post-conference call forecast (the forecast for quarter $t+1$ outstanding 3 days after the conference call for quarter t) and the actual earnings in quarter $t+1$, divided by the absolute earnings in quarter $t+1$, multiplied by 100.	IBES
Earnings change in quarter t	Earnings in quarter t minus earnings in the same quarter in the previous year, standardized by the volatility of earnings changes over the prior 20 quarters (we require at least 10 quarters in the computation).	IBES

(continued)

Table A-1. Continued.

Negativity in presentations, answers, analyst questions ($N_P/N_A/N_Q$)	The ratio $(n-p)/(n+p+1)$, where n and p are the numbers of negative and positive words used in the conference call, respectively. We compute negativity for presentations, answers, and analyst questions separately. Alternatively, in the SOA, we also use the ratio $n/words$, where $words$ is the total number of words in the respective section of the call. We use the word list of Loughran and McDonald (2011) to compute both measures.	Authors' calculation
Negativity change in presentations, answers, analyst questions ($NC_P/NC_A/NC_Q$)	The change in the respective negativity measure from quarter $t-1$ to quarter t.	Authors' calculation
Negativity change in earnings press release	The change in the negativity of the earnings press release from quarter $t-1$ to quarter t. Negativity in press release is defined as the ratio $(n-p)/(n+p+1)$, where n and p are the numbers of negative and positive words used in the earnings press release, respectively. Alternatively, in the SOA, we use negativity frequency, that is, the ratio $n/words$, where $words$ is the total number of words in the press release. We use the word list of Loughran and McDonald (2011) to compute both measures.	Authors' calculation
Post-call forecast dispersion	The standard deviation of analysts' forecasts for earnings in the next quarter $t+1$ outstanding three days after the conference call for quarter t, divided by the absolute value of the mean consensus forecast outstanding three days after the conference call for quarter t, multiplied by 100.	IBES

Table A-2. Calendar-time Tests: Abnormal Returns to Negativity Changes.

This table presents monthly calendar-time portfolio returns to a conference call trading strategy (2003:5-2016:7). In the beginning of each month stocks are ranked into quintile portfolios based on their most recent quarter-to-quarter change in negativity. Portfolio 1 (Low) contains stocks with the lowest negativity changes, whereas portfolio 5 (High) contains the stocks with the highest negativity changes. L-S is the long-short strategy which is long (short) portfolio 1 (5). The strategy is rebalanced monthly and only stocks with beginning of month prices above $5 are included. Small Caps incl. (excl.) means that stocks in the lowest market cap tercile are included (excluded). Alpha is the intercept from a time-series regression of monthly portfolio excess returns on the Carhart (1997) 4-factor model (CH). *t*-statistics are shown in parentheses under the returns. The underlying standard errors account for heteroskedasticity and autocorrelation up to 12 months. The first column of each of the two panels shows means and *t*-statistics of negativity changes in the portfolios.

	Negativity Change in Presentations				Negativity Change in Answers			
	Negativity Changes	Excess Return	Alpha (CH)	Alpha (CH)	Negativity Changes	Excess Return	Alpha (CH)	Alpha (CH)
1 (Low)	-0.294	1.013	0.078	0.010	-0.384	1.046	0.101	-0.014
	(-60.18)	(2.16)	(1.47)	(0.20)	(-89.31)	(2.09)	(1.46)	(-0.23)
2	-0.107	1.001	0.054	-0.031	-0.139	0.941	0.026	-0.032
	(-22.40)	(2.04)	(0.92)	(-0.53)	(-35.56)	(2.04)	(0.54)	(-0.54)
3	-0.003	0.965	-0.004	-0.061	-0.003	0.911	-0.043	-0.094
	(-0.66)	(2.04)	(-0.11)	(-1.31)	(-0.95)	(1.97)	(-0.79)	(-1.76)
4	0.101	0.899	-0.053	-0.080	0.132	0.889	-0.079	-0.110
	(18.58)	(1.89)	(-0.81)	(-1.15)	(35.74)	(1.78)	(-1.43)	(-1.64)
5 (High)	0.300	0.701	-0.228	-0.204	0.377	0.794	-0.158	-0.118
	(43.06)	(1.47)	(-3.66)	(-3.72)	(82.29)	(1.72)	(-2.82)	(-2.65)
L-S(1-5)	-0.594	0.313	0.306	0.214	-0.761	0.252	0.259	0.104
	(-87.28)	(3.48)	(3.47)	(3.35)	(-123.36)	(4.10)	(3.40)	(1.68)
Small Caps	incl.	incl.	incl.	excl.	incl.	incl.	incl.	excl.

Supplementary Online Appendix:

When Managers Change Their Tone, Analysts and Investors Change Their Tune*

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*A previous version of the paper was named "Reading Managerial Tone: How Analysts and the Market Respond to Conference Calls".

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Contents

1 Variable Definitions

To conserve space, the main text of the paper provides definitions for the main dependent and control variables. Therefore, here we provide definitions on all variables used in the study.

[Insert Table SOA-1 about here]

2 Descriptive Statistics

Here we provide descriptive statistics on all variables used in the study.

[Insert Table SOA-2 about here]

3 Full Tables of Main Text

The main text of the paper presents condensed tables (Tables 1, 2, 3, and 4). Here we provide the full set of results, including all controls.

[Insert Tables SOA-3, SOA-4, SOA-5, SOA-6 about here]

4 Forecast Error 7 Days after the Call

The forecast error regressions in Section 4 of the main text employ analyst forecast errors that are measured three days after the conference call. Here we allow analysts more time to respond and hence consider forecast errors that are measured seven days after the conference call.

[Insert Table SOA-7 about here]

The results are presented in Table SOA-7. As with the three-day forecast errors, negativity changes significantly predict seven-day forecast errors. Thus, allowing more time for analysts to incorporate the information contained in managerial conference call tone does not alter our conclusions.

5 Post-call CARs during the quarter (CAR[0,60])

Sections 5.1 and 5.2 of the main text show results for regressions of cumulative abnormal returns around the date of the call (CAR[0,1]) and the subsequent drift period (CAR[2,60]). Here we examine cumulative abnormal returns over the entire quarter, i.e., CAR[0,60].

[Insert Table SOA-8 about here]

The results are presented in Table SOA-8. Quarterly changes in negativity are negatively associated with abnormal stock returns over the quarter after the call. Furthermore, a bleak tone change has more predictive ability than does a bright tone change. These results are thus consistent with those of the main text.

6 Conditional Abnormal Returns to Negativity Changes

Section 5.3 of the main text of the paper presents a profitable trading strategy based on negativity changes in tone. If information processing constraints, such as limited attention, contribute to the slow diffusion of negativity changes into stock prices, the profits to our monthly trading strategy should be related to the stocks' information environment.[1] We examine this conjecture by assessing the profitability to the tone strategy by characteristic groups. More specifically, in the beginning of each month we sort stocks by a given characteristic into terciles. Then, within each tercile group, we further rank stocks into quintile portfolios based on negativity changes, and construct a long-short strategy, which is long (short) low (high) negativity change stocks as before. The characteristics we use are market capitalization, institutional ownership and number of analysts covering a given stock. Larger stocks, stocks with more institutional owners and analysts have more sophisticated and attentive investors. Such investors are less likely to under-react to negativity changes. We hence expect lower profits to the strategy in those firms.

[Insert Table SOA-9 about here]

Consistent with this assertion, in Table SOA-9 we find that the returns to negativity changes in presentations and answers decrease with each of market capitalization, institutional ownership and analyst

[1]For example, Engelberg (2008) finds that stocks of firms with high institutional ownership react more quickly to negative words contained in news stories about firms' earnings announcements.

coverage. These results accord with the idea that the information environment is an important determinant of the speed with which negativity changes are incorporated into stock prices. Notably, however, at least for presentations, the strategy produces positive profits not only in the smallest size, analyst and institutional ownership terciles, which suggests that the documented returns are not limited to the stocks with the relatively lowest attention.

Finally, the last column of Table SOA-9 shows how the returns to the tone strategy vary with the strength of the quantitative earnings surprise, i.e., the absolute value of the mean surprise. Negativity changes are likely to be most informative in high surprise firms because these firms are difficult to read, meaning that objective information is less informative about their performance or prospects. Consistent with this hypothesis, we find that the calendar-time strategy performs best in high surprise firms. Specifically, the long-short returns amount to 0.64% and 0.57% per month for presentations and answers, respectively.

7 Firm Heterogeneity

We expect stronger negativity effects for firms in which managerial tone is ex-ante expected to be more informative. That is, where negativity changes have relatively higher predictive power for either earnings or uncertainty or both, both analysts' and stock market's reaction should be stronger.

Specifically, we posit that implicit qualitative guidance by tone will offer the greatest insights in industries where a large fraction of the constituent firms provide quantitative earnings guidance. This is because industries that require lots of quantitative guidance are likely to have complex business models.[2] Hence, managers in these industries, where information asymmetries presumably are greater, are more likely to use alternative channels to provide implicit guidance. However, an alternative hypothesis is that implicit guidance through tone and explicit guidance are substitutes for one another.

In addition, we hypothesize that firms experiencing high absolute surprises tend to be "cloudy." In these firms, negativity changes should be particularly informative because there is more news to be explained. Therefore, we should observe stronger reactions of earnings, uncertainty, forecast revisions and stock returns for firms with high absolute surprises.

Table SOA-10 provides broad evidence in favor of these predictions. In Panel A, we estimate regressions as in specifications (1) and (6) of Tables SOA-3, SOA-4, SOA-5 across sub-samples. The sample is

[2]For example, roughly 43% of the firms in the business equipment industry (computers, software, and electronic equipment) provide earnings guidance, whereas only around 6% of the firms in the oil, gas and coal extraction and products industry do so.

split into three industry groups, based on the fraction of firms in an industry that have provided quarterly earnings guidance in the time period 90 days before the conference call to the date of the call.

Consistent with tone being more informative in "guiding" industries, the coefficients of negativity changes in both presentations and answers tend to be larger for industries where a high fraction of firms provide earnings guidance. These results hold for earnings, uncertainty, and analysts' and investors' responses. Table SOA-11 provides tests using interaction terms, offering similar inferences.

[Insert Tables SOA-10 and SOA-11 about here]

In Panel B of Table SOA-10, we document that in "cloudier" firm-quarters, analysts and the stock market react more strongly to negativity changes in presentations. This is reflected in the larger tone coefficients for both forecast changes and the stock market response in the high surprise group. Moreover, consistent with these reactions being fundamentally grounded, the negativity change in presentations predicts future changes in earnings and uncertainty more when earnings surprises are high. However, the results for answers are somewhat more ambiguous, as no significant differences in the predictability of earnings and uncertainty are found across the surprise groups. Guiding firms have lower earnings surprises. Restricting the sample to non-guiding firms does not change the results in Panel B. Again, Table SOA-11 shows that similar results obtain when using interaction terms.

Finally, we also find some limited evidence that tone changes in presentations are less informative, and analysts and investors react less to tone changes when firms just meet or beat earnings. These results are consistent with the assertion that in firms where earnings are most likely to be managed, tone is also most likely to be managed, i.e., being less informative.

Overall, these findings show that the market reacts more strongly to tone in firms where tone can be expected to be more informative for future fundamentals. This is as it should be if stock market participants rationally process value-relevant information from the conference call.

8 Definition of Changes

In the main analysis of the paper, we employed quarter-to-quarter changes in negativity, as in eq. (2) of the main text. In doing so, we followed prior literature (Demers and Vega 2010, Davis et al. 2012 and Henry and Leone 2016). Other studies use information from the more distant past. Feldman et al.

(2010), for example, compute changes in tone of the MD&A section of 10-Ks and 10-Qs by subtracting the mean tone of all periodic SEC filings over the prior 400 days. Thus, we re-run our main tests by computing negativity changes as current quarter negativity minus the average negativity over the prior four quarters.

[Insert Table SOA-12 about here]

The results are shown in Panel A of Table SOA-12. They are in line with those in the main analyses. Negativity changes predict earnings, uncertainty as well as analysts' and investors' reactions. Interestingly, in contrast to the analyses with quarter-to-quarter changes, bright tone changes significantly predict both earnings and uncertainty (except in the regressions that employ bright tone changes in answers to predict forecast dispersion). However, the main point is that bleak tone changes have more predictive power than do bright tone changes.

9 Definition of Negativity

Eq. (1a) in the main text of the paper defines negativity as the ratio of negative minus positive words to the sum of negative and positive words, that is, it represents net negativity. As discussed in the paper, it can be difficult to capture positivity in speech because positive words are inherently noisy (e.g., due to the difficulty of accurately adjusting for negation; see, e.g., Loughran and McDonald 2016). We therefore re-run the analyses using the ratio of negative words to total words instead, negativity frequency, as per eq. (1b) in the main text. Avoiding the use of positive words allows us to test whether information content rather than estimation noise is behind the differences in the relative predictive power of bleak tone changes (upticks in negativity) and bright tone changes (downticks in negativity) that we document. Note that in this analysis, we also use negativity frequency for the earnings press release and for analysts' questions, thus applying the same negativity measure consistently everywhere.

Panel B of Table SOA-12 shows the results. Bleak tone changes based on negativity frequency remain a stronger predictor of earnings and uncertainty as well as analysts' and investors' responses than are bright tone changes. These results strengthen our contention that positive and negative tone changes are inherently different in terms of information content. That is, when managers speak more negatively than in the previous call, this tone change has more value-relevance than when they speak more positively. Technically, the meaning of changing towards "less negative/more positive" differs from the meaning of changing towards "more negative/less positive", but it does not matter much whether "less negative/more

positive" arises predominantly from the use of fewer negative words or from the use of more positive words, and whether "more negative/less positive" arises predominantly from the usage of more negative or from the usage of fewer positive words.

10 Media

The analysis separated the effect of managerial tone on the conference call from the tone in the earnings press release and the tone used by analysts. But there are possible other channels that could conceivably inform investors with what we attribute to tone. The most prominent would be traditional and social media. For example, financial reporters might also listen to the call and report the information they distilled from it.[3] But if that information depended on tone, it would still be the causal factor behind stock price reactions, albeit not being delivered via stock analysts.[4]

Some managers employ social media, and even do so on days of conference calls. If so, social media would be complementary to conference calls as a communication channel for managers. (See Chen et al. (2019) for the emergence of "social executives".) Thus, for example, managers might leak information via Twitter in advance of the call. If so, and if those Tweets were correlated with tone changes, our analyses would attribute too much of the market reaction to the conference call. To address this possibility, we examined the explanatory power of conference call tone in the period before social media became important. Panel C of Table SOA-12 restricts the sample to the period ending in Q4 2007, i.e., the period before the massive rise of social media (different cutoffs give very similar results). The results largely accord with those for the full sample. Hence, our negativity measures constructed from conference call transcripts are unlikely to proxy for information that managers convey via social media.

11 Managerial Incentives

Managers may have incentives to tilt their tone when they personally have a great deal at stake. Therefore, we next analyzed whether negativity changes still predict in the "right" way when we focus on a sub-sample of stocks where the wealth of a manager will depend heavily on the stock price. Thus, we ranked firms in the sample based on managerial "delta", i.e., the sensitivity of managerial wealth to changes in

[3]The large literature surveyed in Miller and Skinner (2016) highlights the critical information dissemination role of the business media, obviously including information writers can discern from conference call tone.

[4]Moreover, in some instances, in particular as regards scandals, the media engage in information discovery and production, but this seems somewhat less likely as the driving force of market reactions in our case.

the stock price.[5] Then, within the highest tercile delta sub-sample, we re-run our analyses. The results are shown in Panel D of Table SOA-12. Consistent with the findings in the full sample, bleak tone changes negatively predict future earnings, forecast revisions and stock returns. The effect of bright tone changes has less explanatory power than bleak tone changes. Importantly, there is no evidence that bright tone changes significantly predict in the "wrong" direction, i.e., even when managers have high incentives to tilt tone positively, there is no reliable evidence that they do so to fool the market.

12 Additional Robustness

Table SOA-13 summarizes the findings of a series of alterations to our main specifications.

[Insert Table SOA-13 about here]

Handling of "questions". As mentioned in Section 2.3 of the main text, the words "question" and "questions" are on the Loughran and McDonald (2011) negative words list. Allee and DeAngelis (2015) argue that the words "question" and "questions" should be excluded from the negative word list, because managers often refer to analyst questions in the presentations and answers sections. However, there are also reasons why these words may still indicate trouble and hence be informative. First, analysts may well ask more questions when things are not going well. An increase in the frequency of the word "question" in analyst questions ("I've got a question...") or in answers therefore may represent an adverse signal. Second, managers sometimes ask analysts to repeat a negatively flavored question, which may be a natural tactic for evading an unpleasant question. For these reasons, we retain these words in the word list for our main tests. To examine the robustness of our results, we redefine our negativity measure by excluding these words from the word counts. As shown in Panel A of Table SOA-13, equivalent results are found.

Distance from the earnings announcement. 77% of the conference calls take place on the day of the earnings announcement; 22% take place on the following day; and almost all other calls take place in the following two weeks. Restricting the sample to firms whose conference calls and earnings announcements coincide does not change the results, as seen in Table SOA-13, Panel B.

[5] We download executives' delta from Lalitha Naveen's homepage. The methods were developed in Core and Guay (2002) and Coles et al. (2006). Delta is defined as the dollar change in wealth due to a 1% change in the stock price. The variable is computed on the executive level. Hence, for each firm we compute a firm-level delta by summing over the deltas of the respective CEOs and CFOs (the executives who speak most of the time). We follow Edmans et al. (2009) and scale this aggregate delta by total compensation (TDC1 in Execucomp).

Industry-quarter fixed effects. Recall that we control for unobserved differences across industries and quarters by including firm industry and quarter fixed effects in the panel specifications of the main text. One concern is that heterogeneity across industries in different quarters could have affected our results. Therefore we re-run the analyses with industry-quarter fixed effects instead. The results prove similar, as seen in Table SOA-13, Panel C.

CEO speech and CEO fixed effects. In our analyses we consider the tone of all management members jointly, and refer to these members collectively as the manager. In addition, we control for unobserved differences across firms by including firm fixed effects in the panel specifications. Some research documents that managers differ in communication styles (Bamber et al. 2010, Dzieliński et al. 2019), which also indicates personality differences (Gow et al. 2016; Harrison et al. ming) and has to do with cultural background (Brochet et al. 2016). Therefore, we re-estimate our specifications by (1) computing negativity from CEO tone only, and (2) substituting CEO fixed effects for firm fixed effects. The results remain largely unaffected. See Panel D of Table SOA-13.

Five-dollar price constraint. In the calendar-time tests a $5 constraint was applied to avoid our results being driven by microstructure effects. Imposing this constraint in the panel regressions, as well, does not alter our conclusions. See Panel E of Table SOA-13.

Two-way clustering of standard errors. In addition to clustering standard errors at the firm level (as in the main analysis), we also clustered standard errors across time quarters. These two-way clustered standard errors account for both time-series and cross-sectional correlation in the error term (see Petersen 2009). The results were sustained. See Panel F of Table SOA-13.

Bleak and bright tone changes in questions and earnings press release. We also allowed for asymmetric effects of negativity changes of the earnings press release and analysts' questions. See Panel G of Table SOA-13. The results were not significantly affected. Interestingly, the results also suggest that, in line with managerial tone changes, bleak tone changes have generally more predictive power than bright tone changes in the earnings press release as well as analysts' questions (non-tabulated).

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Table SOA-1. Variable Definitions.

This table is the full version of Table A-1 in the main paper. It presents definitions of the variables in the study.

% Atypical tense	Atypical tense is the weighted average percentage of the manager's verbs not in the past tense in the presentation and the manager's verbs not in the present or future tense in the answers, weighted by the number of verbs in the two respective conference call parts. To automate the recognition of verb tenses we use the Natural Language Toolkit library as follows: (1) all words in each sentence are tagged with part-of-speech tags (POS tagging); (2) each tagged sentence is chunked into name and verb phrases; (3) for each verb phrase, its tense is deduced from the POS tag of the first word utilizing a number of heuristics to correct the most common errors of POS tagging; (4) after we assign the tenses to each sentence we classify them as describing the past, present, or future with the conference call day as the reference point (where we classify the present perfect tense for our use as past-oriented speech, consistent with the definition of Merriam-Webster dictionary: "present perfect is a verb tense that expresses action or state completed at the time of speaking"); (5) if a sentence contains several verb phrases, its tense is defined as the most used tense among its phrases; (6) if a most used tense is not identified, the sentence tense is not defined.	Authors' calculation
% Financial words	The percent financial words used by management, computed using the word list in Matsumoto et al. (2011).	Authors' calculation
% Numbers in total words	The percent numbers used by management.	Authors' calculation
% Strong modal words	The percent strong modal words used by management, computed using the word list of Loughran and McDonald (2011).	Authors' calculation
% Uncertain words	The percent uncertain words used by management, computed using the word list of Loughran and McDonald (2011).	Authors' calculation
Bleak tone change	Defined as the absolute value of $NC_P * \{NC_P > 0\}$ and absolute value of $NC_A * \{NC_A > 0\}$ for presentations and answers, respectively. $1\{NC > 0\}$ is an indicator variable which is equal to one if the corresponding negativity change is positive; it is zero if the negativity change is negative.	Authors' calculation
Bright tone change	Defined as the absolute value of $NC_P * 1\{NC_P \leq 0\}$ and absolute value of $NC_A * \{NC_A \leq 0\}$ for presentations and answers, respectively. $1\{NC \leq 0\}$ is an indicator variable which is equal to one if the corresponding negativity change is negative; it is zero if the negativity change is positive.	Authors' calculation
Book-to-market in month t	Logarithm of the ratio of book value of equity divided by market capitalization as at the end of month t.	CRSP, Compustat

(continued)

Table SOA-1. Continued.

CAR[0,1]	The two-day, [0,1] cumulative Daniel et al. (1997) (DGTW) characteristic-adjusted stock return on and after the conference call date, in percent. DGTW characteristic-adjusted returns are defined as raw daily returns minus the returns on a portfolio of all CRSP common stocks in the same size, book-to-market, and 1-year momentum quintiles.	CRSP, WRDS, Authors' calculation
CAR[2,60]	The 59 trading days [2,60] cumulative DGTW characteristic-adjusted stock return in percent from 2 days after the conference call date through the 60th day after that date.	CRSP, WRDS, Authors' calculation
CAR[0,60]	The 61 trading days [0,60] cumulative DGTW characteristic-adjusted stock return in percent from the day of the conference call date through the 60th day after that date.	CRSP, WRDS, Authors' calculation
Complexity	The words per sentence, calculated as a weighted average of presentation and answers.	Authors' calculation
Consensus forecast change	The change in the analysts' consensus forecast for earnings in quarter $t+1$, from the day before the conference call to three days after the call, divided by the absolute earnings in quarter $t+1$, multiplied by 100.	IBES
Consensus forecast error	The difference between the post-conference call forecast (the forecast for quarter $t+1$ outstanding 3 days after the conference call for quarter t) and the actual earnings in quarter $t+1$, divided by the absolute earnings in quarter $t+1$, multiplied by 100.	IBES
Earnings change in quarter t	Earnings in quarter t minus earnings in the same quarter in the previous year, standardized by the volatility of earnings changes over the prior 20 quarters (we require at least 10 quarters in the computation).	IBES
Earnings surprise	The difference between actual and consensus forecast earnings (the mean of the most recent analyst forecasts announced during the 90 days before the quarterly earnings announcement), divided by the share price 5 days before the earnings announcement.	IBES, CRSP
Industry earnings guidance	The fraction of firms in an industry that have provided quarterly earnings guidance in the time period 90 days before the conference call to the date of the call. A firm is defined to provide earnings guidance if it has issued either a point or range quarterly earnings estimate.	IBES
Inconsistency in tone	The absolute difference in negativity between presentations (prepared speech) and answers (improvised speech).	Authors' calculation
Institutional ownership	Percentage of shares held by institutional investors at the end of the most recent reporting period. Values above 100% are trimmed.	Thompson Reuters 13F, CRSP

(continued)

Table SOA-1. Continued.

Momentum	The cumulative stock return over the prior twelve months, excluding the return of the most recent month. The variable is computed on a monthly basis.	CRSP
Monthly volatility in quarter t	The monthly stock volatility computed from monthly return data over the past 48 months.	CRSP
Negativity in presentations, answers, analyst questions ($N_P/N_A/N_Q$)	The ratio $(n-p)/(n+p+1)$, where n and p are the numbers of negative and positive words used in the conference call, respectively. We compute negativity for presentations, answers, and analyst questions separately. Alternatively, in the SOA, we also use the ratio $n/words$, where *words* is the total number of words in the respective section of the call. We use the word list of Loughran and McDonald (2011) to compute both measures.	Authors' calculation
Negativity change in presentations, answers, analyst questions ($NC_P/NC_A/NC_Q$)	The change in the respective negativity measure from quarter $t-1$ to quarter t.	Authors' calculation
Negativity change in earnings press release	The change in the negativity of the earnings press release from quarter $t-1$ to quarter t. Negativity in press release is defined as the ratio $(n-p)/(n+p+1)$, where n and p are the numbers of negative and positive words used in the earnings press release, respectively. Alternatively, in the SOA, we use negativity frequency, that is, the ratio $n/words$, where *words* is the total number of words in the press release. We use the word list of Loughran and McDonald (2011) to compute both measures.	Authors' calculation
Number of analysts	The number of analysts who cover a firm, based on the the number of valid estimates for the consensus forecast (forecasts with announcement dates older than 90 days before the quarterly earnings announcement are excluded).	IBES
Post-call forecast dispersion	The standard deviation of analysts' forecasts for earnings in the next quarter $t+1$ outstanding three days after the conference call for quarter t, divided by the absolute value of the mean consensus forecast outstanding three days after the conference call for quarter t, multiplied by 100.	IBES
Pre-call forecast dispersion	The standard deviation of analysts' forecasts for earnings in the next quarter $t+1$ outstanding the day before the conference call for quarter t, divided by the absolute value of the mean consensus forecast outstanding the day before the conference call for quarter t, multiplied by 100.	IBES
Return reversal	Stock return in month t. Captures the well-know short-term reversal effect.	CRSP
Size in month t	Logarithm of the stock's market capitalization as at the end of month t.	CRSP

(continued)

Table SOA-1. Continued.

Size in quarter t	Logarithm of the stock's market capitalization as at the end of quarter t.	Compustat
Stock return in quarter t	The firm's capital gain in the elapsed quarter, that is, the difference of the share price 5 trading days before an earnings announcement for quarter t minus the share price 5 trading days after the earnings announcement for quarter $t-1$, divided by the stock price 5 days after the earnings announcement for quarter $t-1$.	CRSP

Table SOA-2. Descriptive Statistics.

This table provides descriptive statistics for the main variables of interest. All variables are defined in Table SOA-1.

Panel A. Company characteristics and analyst behavior

	Obs	Mean	Std. Dev.	Min	Max
Earnings change in quarter $t+1$	92,869	0.180	1.096	-3.014	3.395
Post-call forecast dispersion	94,784	24.865	51.933	0.000	563.116
Consensus forecast change	95,763	-9.352	33.800	-291.667	91.026
Consensus forecast error	98,651	5.110	62.098	-268.750	472.222
CAR[0,1]	106,965	-0.020	7.256	-25.021	23.608
CAR[2,60]	106,342	0.233	15.358	-53.035	54.867
CAR[0,60]	106,338	0.246	17.358	-58.636	59.019
Earnings change in quarter t	94,355	0.182	1.163	-2.949	3.378
Earnings surprise	103,094	0.000	0.013	-0.079	0.045
Size in quarter t	117,083	6.940	1.768	3.053	11.535
Book-to-market in quarter t	113,567	-0.792	0.797	-3.278	1.010
Stock return in quarter t	115,495	2.352	19.349	-51.373	72.917
Monthly volatility in quarter t	116,832	0.136	0.071	0.000	0.408
Pre-call forecast dispersion	85,369	0.292	0.693	0.000	5.100

Panel B. Managerial tone and other communication characteristics

	Obs	Mean	Std. Dev.	Min	Max
Ln(Words in the presentation)	117,102	7.905	0.419	6.541	8.766
Ln(Words in the answers)	117,102	7.782	0.681	4.905	8.844
Ln(Words in the questions)	117,102	6.821	1.052	0.000	8.003
Negativity in presentations	117,102	-0.308	0.272	-0.809	0.435
Negativity in answers	117,102	-0.240	0.262	-0.773	0.500
Negativity in analysts' questions	117,102	0.115	0.278	-0.571	0.767
Negativity in earnings press release	116,425	-0.003	0.333	-0.800	0.718
Negativity change in presentations	107,822	0.000	0.213	-0.553	0.579
Negativity change in answers	107,822	-0.002	0.276	-0.731	0.724
Negativity change in analysts' questions	107,822	-0.002	0.335	-0.844	0.833
Negativity change in earnings press release	107,250	0.002	0.248	-0.722	0.724

(continued)

Table SOA-2. Continued.

Panel B. Managerial tone and other communication characteristics

	Obs	Mean	Std. Dev.	Min	Max
Bleak tone change in presentations	107,822	0.083	0.128	0.000	0.579
Bright tone change in presentations	107,822	0.083	0.124	0.000	0.553
Bleak tone change in answers	107,822	0.107	0.162	0.000	0.724
Bright tone change in answers	107,822	0.109	0.163	0.000	0.731
Inconsistency in tone	117,102	0.236	0.186	0.000	1.574
% Uncertain words	117,102	0.839	0.249	0.353	1.576
% Strong modal words	117,102	0.632	0.205	0.231	1.225
% Financial words	117,102	2.373	0.827	0.678	4.837
% Atypical tense	117,060	41.232	6.149	27.536	57.684
Complexity (words per sentence)	117,102	20.650	2.514	15.170	27.866
% Numbers in total words	117,102	2.896	1.018	0.993	6.055
% Past tense words in presentation	117,100	47.095	8.645	0.000	92.308
% Present tense words in presentation	117,100	43.566	8.192	5.769	100.000
% Future tense words in presentation	117,100	9.339	3.576	0.000	66.667
% Past tense words in answers	117,062	28.289	6.201	0.000	100.000
% Present tense words in answers	117,062	62.399	6.878	0.000	100.000
% Future tense words in answers	117,062	9.312	4.326	0.000	100.000

Table SOA-3. Do Managerial Negativity Changes Help to Predict Earnings and Uncertainty?

This table is the full version of Table 1 in the main paper. It presents panel and Fama-MacBeth regressions (2003:Q2-2016:Q2). The dependent variable in columns (1) to (5) is the earnings change in quarter $t+1$. In columns (6) to (10), the dependent variable is the post-call forecast standard deviation of analysts' forecasts outstanding three days after the conference call. All variables are defined in Table SOA-1. Industry fixed effects (Industry FE) are based on the Fama-French 12 Industry classification. All explanatory variables are standardized to have a zero mean and a standard deviation of one. t-statistics are shown in parentheses. The underlying standard errors in the panel regressions are clustered on the firm level and are robust to heteroskedasticity, whereas the standard errors in the Fama-MacBeth regressions account for heteroskedasticity and autocorrelation up to 4 quarters.

	Earnings Change in quarter $t+1$					Post-call Forecast Dispersion				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Negativity change in presentations	-0.021 (-5.57)					0.810 (4.80)				
Negativity change in answers	-0.011 (-2.87)					0.094 (0.56)				
Bleak tone change in presentations		-0.028 (-6.85)		-0.027 (-6.33)			0.886 (4.66)		1.066 (6.95)	
Bright tone change in presentations		-0.001 (-0.29)		-0.005 (-1.09)			-0.085 (-0.49)		0.196 (1.14)	
Bleak tone change in answers			-0.019 (-4.61)		-0.020 (-4.03)			0.443 (2.25)		0.454 (2.58)
Bright tone change in answers			-0.003 (-0.74)		-0.004 (-1.63)			0.188 (1.02)		0.123 (0.80)
Earnings change in quarter t	0.561 (85.34)	0.560 (85.31)	0.562 (85.52)	0.588 (30.71)	0.589 (30.92)	-1.815 (-9.09)	-1.793 (-9.00)	-1.841 (-9.21)	-2.008 (-6.85)	-2.053 (-6.98)
Earnings surprise	-0.070 (-15.00)	-0.070 (-14.98)	-0.069 (-14.78)	-0.064 (-8.04)	-0.064 (-7.86)	-0.801 (-2.62)	-0.803 (-2.63)	-0.841 (-2.75)	-0.954 (-5.45)	-0.982 (-5.59)
Negativity change in earnings press release	-0.012 (-3.48)	-0.012 (-3.51)	-0.017 (-5.02)	-0.009 (-2.94)	-0.013 (-4.19)	0.261 (1.77)	0.259 (1.76)	0.445 (3.14)	0.216 (1.25)	0.373 (1.93)
Negativity change in analysts' questions	-0.005 (-1.56)	-0.007 (-2.17)	-0.007 (-2.01)	-0.006 (-2.09)	-0.005 (-1.85)	0.078 (0.51)	0.095 (0.63)	0.137 (0.90)	0.051 (0.38)	0.068 (0.50)
Size in quarter t	-0.092 (-5.51)	-0.093 (-5.56)	-0.095 (-5.72)	0.041 (6.05)	0.041 (6.10)	-7.919 (-8.08)	-7.904 (-8.07)	-7.797 (-7.97)	-2.861 (-10.37)	-2.851 (-10.28)

(continued)

Table SOA-3. Continued.

	Earnings Change in quarter $t+1$					Post-call Forecast Dispersion				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Book-to-market in quarter t	-0.144	-0.144	-0.143	-0.053	-0.053	1.634	1.623	1.603	1.587	1.572
	(-15.51)	(-15.46)	(-15.40)	(-6.71)	(-6.88)	(3.48)	(3.46)	(3.41)	(4.72)	(4.65)
Stock return in quarter t	0.064	0.064	0.066	0.052	0.054	-0.670	-0.661	-0.739	-0.445	-0.527
	(14.83)	(14.82)	(15.29)	(9.76)	(9.97)	(-2.78)	(-2.74)	(-3.06)	(-1.57)	(-1.84)
Monthly volatility in quarter t	0.004	0.003	0.004	-0.017	-0.016	1.087	1.098	1.085	3.448	3.449
	(0.60)	(0.53)	(0.61)	(-2.12)	(-2.05)	(2.49)	(2.51)	(2.48)	(13.89)	(13.69)
Pre-call forecast dispersion	-0.008	-0.008	-0.008	-0.015	-0.015	24.118	24.114	24.110	26.673	26.663
	(-2.14)	(-2.09)	(-2.10)	(-3.40)	(-3.29)	(42.07)	(42.06)	(42.07)	(29.50)	(29.51)
Ln(Words in the presentation)	-0.030	-0.032	-0.029	-0.015	-0.012	1.103	1.149	1.076	0.891	0.767
	(-4.22)	(-4.46)	(-4.12)	(-3.19)	(-2.52)	(3.38)	(3.51)	(3.30)	(3.58)	(3.00)
Ln(Words in the answers)	-0.003	-0.004	-0.005	-0.002	-0.004	0.861	0.864	0.910	0.078	0.140
	(-0.46)	(-0.50)	(-0.70)	(-0.44)	(-0.78)	(2.47)	(2.49)	(2.61)	(0.32)	(0.56)
Ln(Words in the questions)	0.005	0.005	0.005	0.007	0.007	-0.023	-0.024	-0.034	-0.028	-0.044
	(1.27)	(1.27)	(1.35)	(1.92)	(1.86)	(-0.12)	(-0.12)	(-0.17)	(-0.11)	(-0.18)
Inconsistency in tone	0.001	-0.001	0.004	0.002	0.006	0.124	0.122	0.014	0.303	0.203
	(0.18)	(-0.20)	(1.07)	(0.57)	(1.67)	(0.66)	(0.68)	(0.07)	(2.02)	(1.21)
% Uncertain words	-0.023	-0.023	-0.025	-0.009	-0.010	0.464	0.454	0.515	-0.162	-0.126
	(-4.55)	(-4.54)	(-4.81)	(-2.79)	(-2.99)	(1.99)	(1.94)	(2.21)	(-0.83)	(-0.64)
% Strong modal words	-0.032	-0.032	-0.032	-0.026	-0.026	0.964	0.955	0.958	0.757	0.751
	(-7.79)	(-7.67)	(-7.76)	(-5.83)	(-5.70)	(5.11)	(5.08)	(5.07)	(4.24)	(4.17)
% Financial words	0.036	0.036	0.036	0.017	0.016	1.082	1.092	1.111	0.191	0.188
	(5.15)	(5.09)	(5.04)	(3.44)	(3.36)	(3.05)	(3.08)	(3.13)	(1.35)	(1.32)
% Atypical tense	-0.001	-0.001	-0.001	0.006	0.007	0.547	0.546	0.524	0.527	0.525
	(-0.20)	(-0.24)	(-0.12)	(1.22)	(1.29)	(1.95)	(1.95)	(1.88)	(1.87)	(1.88)
Complexity (words per sentence)	-0.008	-0.008	-0.009	-0.002	-0.003	-0.074	-0.077	-0.070	0.261	0.264
	(-1.88)	(-1.83)	(-1.91)	(-0.74)	(-0.87)	(-0.35)	(-0.37)	(-0.33)	(1.17)	(1.17)
% Numbers in total words	0.007	0.007	0.007	0.007	0.007	-0.277	-0.272	-0.263	-0.320	-0.320
	(1.05)	(1.02)	(0.99)	(1.99)	(2.02)	(-0.88)	(-0.87)	(-0.84)	(-1.65)	(-1.69)
Observations	70,997	70,997	70,997	70,997	70,997	71,714	71,714	71,714	71,714	71,714

(continued)

Table SOA-3. Continued.

	Earnings Change in quarter $t+1$					Post-call Forecast Dispersion				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
R-squared	0.305	0.305	0.305	0.363	0.363	0.266	0.266	0.266	0.388	0.387
Fama-MacBeth	No	No	No	Yes	Yes	No	No	No	Yes	Yes
Quarter FE	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No

Table SOA-4. Do Analysts Respond to Managerial Negativity Changes?

This table is the full version of Table 2 in the main paper. It presents panel and Fama-MacBeth regressions (2003:Q2-2016:Q2). The dependent variable in columns (1) to (5) is the analyst consensus forecast change in percent of earnings in quarter $t+1$. In columns (6) to (10), the dependent variable is the analyst consensus forecast error in percent of earnings in quarter $t+1$. All variables are defined in Table SOA-1. Industry fixed effects (Industry FE) are based on the Fama-French 12 Industry classification. All explanatory variables are standardized to have a zero mean and a standard deviation of one. t-statistics are shown in parentheses. The underlying standard errors in the panel regressions are clustered on the firm level and are robust to heteroskedasticity, whereas the standard errors in the Fama-MacBeth regressions account for heteroskedasticity and autocorrelation up to 4 quarters.

	Consensus Forecast Change					Consensus Forecast Error				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Negativity change in presentations	-1.854 (-14.42)					1.148 (4.96)				
Negativity change in answers	-0.618 (-5.00)					0.809 (3.35)				
Bleak tone change in presentations		-1.744 (-11.41)		-1.715 (-12.75)			0.930 (3.35)		1.311 (4.34)	
Bright tone change in presentations		0.545 (4.33)		0.465 (2.74)			-0.559 (-2.23)		-0.011 (-0.03)	
Bleak tone change in answers			-0.821 (-5.65)		-0.748 (-5.75)			0.352 (1.33)		0.583 (2.25)
Bright tone change in answers			0.216 (1.65)		0.289 (2.27)			-0.776 (-3.02)		-0.441 (-1.79)
Earnings change in quarter t	3.484 (21.79)	3.449 (21.62)	3.549 (22.09)	3.753 (10.33)	3.815 (10.45)	-3.395 (-12.35)	-3.382 (-12.31)	-3.440 (-12.51)	-3.186 (-7.42)	-3.219 (-7.60)
Earnings surprise	2.987 (13.52)	2.998 (13.56)	3.077 (13.87)	2.794 (8.63)	2.894 (8.76)	-2.611 (-6.91)	-2.624 (-6.95)	-2.670 (-7.05)	-4.943 (-16.96)	-5.030 (-17.02)
Negativity change in earnings press release	-0.752 (-6.24)	-0.759 (-6.30)	-1.179 (-9.73)	-0.757 (-6.70)	-1.141 (-8.61)	0.656 (2.89)	0.672 (2.96)	0.925 (4.14)	0.591 (1.91)	0.791 (2.43)
Negativity change in analysts' questions	-0.929 (-7.98)	-1.049 (-9.05)	-1.069 (-9.17)	-1.029 (-12.58)	-1.034 (-13.17)	0.509 (2.29)	0.667 (3.06)	0.600 (2.73)	0.797 (3.58)	0.730 (3.24)
Size in quarter t	-0.692 (-1.07)	-0.732 (-1.13)	-0.950 (-1.47)	2.840 (17.30)	2.797 (16.62)	12.585 (10.73)	12.624 (10.76)	12.724 (10.85)	-2.673 (-6.48)	-2.687 (-6.52)

(continued)

Table SOA-4. Continued.

	Consensus Forecast Change					Consensus Forecast Error				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Book-to-market in quarter t	-2.480	-2.459	-2.414	-1.162	-1.148	4.835	4.818	4.798	2.527	2.550
	(-7.48)	(-7.43)	(-7.30)	(-7.27)	(-7.54)	(7.72)	(7.69)	(7.67)	(5.43)	(5.51)
Stock return in quarter t	2.395	2.396	2.552	2.147	2.277	-3.668	-3.690	-3.769	-3.147	-3.249
	(13.62)	(13.63)	(14.52)	(12.91)	(13.49)	(-11.38)	(-11.44)	(-11.72)	(-9.36)	(-9.53)
Monthly volatility in quarter t	1.036	1.020	1.043	-1.169	-1.163	-1.414	-1.408	-1.417	0.475	0.480
	(3.78)	(3.73)	(3.80)	(-5.64)	(-5.61)	(-2.56)	(-2.55)	(-2.57)	(1.13)	(1.15)
Pre-call forecast dispersion	-1.381	-1.374	-1.369	-2.595	-2.592	-2.536	-2.541	-2.543	-1.313	-1.334
	(-5.69)	(-5.67)	(-5.62)	(-9.42)	(-9.26)	(-6.18)	(-6.19)	(-6.20)	(-2.58)	(-2.60)
Ln(Words in the presentation)	-1.457	-1.532	-1.406	-0.958	-0.863	0.823	0.854	0.803	0.528	0.413
	(-6.05)	(-6.36)	(-5.83)	(-8.57)	(-6.99)	(1.84)	(1.91)	(1.79)	(1.77)	(1.50)
Ln(Words in the answers)	-1.403	-1.418	-1.447	-1.419	-1.434	0.034	0.057	-0.011	-0.358	-0.347
	(-5.73)	(-5.80)	(-5.86)	(-8.36)	(-8.42)	(0.07)	(0.12)	(-0.02)	(-0.85)	(-0.83)
Ln(Words in the questions)	-0.236	-0.235	-0.210	-0.384	-0.346	-0.137	-0.139	-0.154	-0.176	-0.185
	(-1.87)	(-1.85)	(-1.65)	(-2.69)	(-2.42)	(-0.56)	(-0.57)	(-0.63)	(-0.48)	(-0.50)
Inconsistency in tone	0.081	-0.013	0.266	-0.076	0.146	-0.261	-0.107	-0.307	0.241	0.069
	(0.58)	(-0.10)	(1.86)	(-0.58)	(0.92)	(-1.07)	(-0.46)	(-1.26)	(1.00)	(0.28)
% Uncertain words	-0.482	-0.490	-0.603	-0.230	-0.304	0.185	0.218	0.266	-0.240	-0.221
	(-2.77)	(-2.82)	(-3.46)	(-1.46)	(-1.96)	(0.57)	(0.67)	(0.82)	(-0.97)	(-0.86)
% Strong modal words	-1.192	-1.166	-1.173	-0.990	-0.995	0.715	0.692	0.699	0.677	0.697
	(-8.20)	(-8.03)	(-8.06)	(-6.87)	(-6.90)	(2.72)	(2.63)	(2.66)	(3.63)	(3.71)
% Financial words	0.152	0.140	0.092	0.259	0.260	-1.381	-1.375	-1.351	-0.042	-0.048
	(0.62)	(0.57)	(0.38)	(1.25)	(1.25)	(-2.86)	(-2.85)	(-2.80)	(-0.12)	(-0.14)
% Atypical tense	-0.700	-0.715	-0.649	-0.730	-0.679	-0.086	-0.059	-0.124	-1.044	-1.093
	(-3.34)	(-3.41)	(-3.10)	(-4.24)	(-3.77)	(-0.21)	(-0.15)	(-0.31)	(-2.71)	(-2.72)
Complexity (words per sentence)	-0.222	-0.209	-0.233	-0.125	-0.140	0.346	0.332	0.354	-0.090	-0.064
	(-1.40)	(-1.32)	(-1.47)	(-1.25)	(-1.37)	(1.24)	(1.19)	(1.27)	(-0.39)	(-0.27)
% Numbers in total words	0.462	0.452	0.427	0.034	0.008	-1.283	-1.274	-1.261	-1.298	-1.282
	(1.95)	(1.91)	(1.80)	(0.18)	(0.05)	(-2.92)	(-2.90)	(-2.87)	(-5.10)	(-5.04)
Observations	70,850	70,850	70,850	70,850	70,850	70,801	70,801	70,801	70,801	70,801

(continued)

Table SOA-4. Continued.

	Consensus Forecast Change					Consensus Forecast Error				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
R-squared	0.073	0.073	0.069	0.121	0.118	0.035	0.035	0.035	0.074	0.073
Fama-MacBeth	No	No	No	Yes	Yes	No	No	No	Yes	Yes
Quarter FE	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No

Table SOA-5. Do Investors Respond to Managerial Negativity Changes?

This table is the full version of Table 3 in the main paper. It presents panel and Fama-MacBeth regressions (2003:Q2-2016:Q2). The dependent variable in columns (1) to (5) is CAR[0,1], the two-day, [0,1] cumulative DGTW characteristic-adjusted stock return on and after the conference call date, in percent. In columns (6) to (10), the dependent variable is CAR[2,60], the 59 trading days [2,60] cumulative DGTW characteristic-adjusted stock return in percent from 2 days after the conference call date through the 60th day after that date. All variables are defined in Table SOA-1. Industry fixed effects (Industry FE) are based on the Fama-French 12 Industry classification. All explanatory variables are standardized to have a zero mean and a standard deviation of one. t-statistics are shown in parentheses. The underlying standard errors in the panel regressions are clustered on the firm level and are robust to heteroskedasticity, whereas the standard errors in the Fama-MacBeth regressions account for heteroskedasticity and autocorrelation up to 4 quarters.

	CAR[0,1]					CAR[2,60]				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Negativity change in presentations	-0.706					-0.100				
	(-24.28)					(-1.68)				
Negativity change in answers	-0.316					-0.107				
	(-11.56)					(-1.82)				
Bleak tone change in presentations		-0.548		-0.553			-0.165		-0.226	
		(-17.20)		(-14.33)			(-2.49)		(-4.29)	
Bright tone change in presentations		0.338		0.351			-0.029		0.006	
		(11.33)		(8.71)			(-0.47)		(0.15)	
Bleak tone change in answers			-0.438		-0.429			-0.030		-0.082
			(-13.92)		(-14.90)			(-0.45)		(-1.32)
Bright tone change in answers			0.057		0.071			0.110		0.122
			(1.94)		(3.15)			(1.68)		(2.08)
Earnings change in quarter t	0.727	0.721	0.750	0.703	0.728	0.297	0.291	0.301	0.212	0.218
	(23.04)	(22.82)	(23.60)	(9.83)	(9.86)	(4.53)	(4.44)	(4.59)	(1.63)	(1.69)
Earnings surprise	1.163	1.169	1.197	1.156	1.186	-0.004	-0.002	0.001	0.110	0.121
	(24.31)	(24.36)	(24.62)	(24.54)	(23.35)	(-0.05)	(-0.03)	(0.01)	(1.26)	(1.41)
Negativity change in earnings press release	-0.299	-0.305	-0.461	-0.302	-0.455	-0.034	-0.035	-0.057	-0.097	-0.129
	(-11.25)	(-11.48)	(-17.34)	(-9.50)	(-12.32)	(-0.61)	(-0.64)	(-1.06)	(-1.75)	(-2.36)
Negativity change in analysts' questions	-0.638	-0.699	-0.690	-0.695	-0.690	-0.064	-0.085	-0.073	-0.178	-0.159
	(-23.64)	(-25.98)	(-25.39)	(-15.93)	(-16.00)	(-1.17)	(-1.56)	(-1.32)	(-3.97)	(-3.26)
Size in quarter t	-2.030	-2.047	-2.130	-0.159	-0.178	-7.606	-7.614	-7.616	-0.044	-0.046
	(-13.79)	(-13.91)	(-14.31)	(-6.21)	(-6.66)	(-22.57)	(-22.59)	(-22.62)	(-0.36)	(-0.37)

(continued)

Table SOA-5. Continued.

	CAR[0,1]					CAR[2,60]				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Book-to-market in quarter t	0.109	0.115	0.134	0.036	0.049	0.286	0.289	0.289	0.058	0.056
	(1.55)	(1.65)	(1.91)	(1.15)	(1.50)	(1.66)	(1.68)	(1.68)	(0.44)	(0.42)
Stock return in quarter t	-0.283	-0.275	-0.222	-0.270	-0.221	-0.576	-0.575	-0.567	-0.304	-0.288
	(-7.54)	(-7.35)	(-5.93)	(-5.58)	(-4.66)	(-6.84)	(-6.83)	(-6.75)	(-2.28)	(-2.13)
Monthly volatility in quarter t	-0.027	-0.028	-0.025	-0.142	-0.140	0.308	0.305	0.308	0.135	0.126
	(-0.44)	(-0.47)	(-0.40)	(-4.06)	(-4.04)	(2.43)	(2.41)	(2.43)	(0.57)	(0.53)
Pre-call forecast dispersion	0.097	0.100	0.101	0.039	0.042	-0.003	-0.001	-0.002	0.003	0.004
	(2.85)	(2.93)	(2.94)	(1.16)	(1.24)	(-0.04)	(-0.02)	(-0.03)	(0.03)	(0.05)
Ln(Words in the presentation)	-0.142	-0.158	-0.119	-0.021	0.002	-0.146	-0.159	-0.144	-0.093	-0.069
	(-2.91)	(-3.23)	(-2.43)	(-0.62)	(0.06)	(-1.31)	(-1.42)	(-1.29)	(-1.47)	(-1.09)
Ln(Words in the answers)	-0.273	-0.282	-0.299	-0.129	-0.151	0.164	0.160	0.171	0.093	0.102
	(-5.14)	(-5.30)	(-5.59)	(-3.68)	(-4.13)	(1.43)	(1.40)	(1.50)	(0.97)	(1.01)
Ln(Words in the questions)	0.062	0.062	0.072	0.059	0.071	-0.071	-0.071	-0.070	0.016	0.021
	(2.06)	(2.07)	(2.40)	(2.30)	(2.82)	(-1.14)	(-1.14)	(-1.12)	(0.27)	(0.34)
Inconsistency in tone	-0.020	-0.078	0.062	-0.055	0.070	-0.067	-0.084	-0.067	-0.027	-0.003
	(-0.74)	(-2.93)	(2.25)	(-2.12)	(2.15)	(-1.13)	(-1.44)	(-1.11)	(-0.43)	(-0.06)
% Uncertain words	-0.094	-0.106	-0.140	-0.086	-0.106	0.101	0.100	0.094	0.087	0.081
	(-2.58)	(-2.90)	(-3.79)	(-2.88)	(-3.48)	(1.18)	(1.16)	(1.09)	(0.93)	(0.87)
% Strong modal words	-0.054	-0.045	-0.048	-0.076	-0.080	0.117	0.121	0.118	0.075	0.073
	(-1.77)	(-1.47)	(-1.57)	(-2.92)	(-3.19)	(1.76)	(1.83)	(1.79)	(1.35)	(1.31)
% Financial words	-0.138	-0.140	-0.160	-0.027	-0.036	0.157	0.154	0.154	0.119	0.121
	(-2.68)	(-2.71)	(-3.10)	(-0.81)	(-1.09)	(1.39)	(1.37)	(1.37)	(1.47)	(1.46)
% Atypical tense	-0.214	-0.224	-0.194	-0.114	-0.090	0.056	0.053	0.059	0.129	0.135
	(-4.93)	(-5.16)	(-4.46)	(-3.54)	(-2.55)	(0.58)	(0.55)	(0.62)	(2.11)	(2.18)
Complexity (words per sentence)	-0.111	-0.106	-0.116	-0.078	-0.085	-0.085	-0.082	-0.086	-0.064	-0.069
	(-3.39)	(-3.22)	(-3.51)	(-2.46)	(-2.65)	(-1.15)	(-1.12)	(-1.16)	(-1.22)	(-1.35)
% Numbers in total words	0.223	0.219	0.209	0.118	0.111	0.291	0.289	0.289	0.150	0.142
	(4.55)	(4.47)	(4.26)	(6.83)	(6.57)	(2.70)	(2.68)	(2.68)	(1.95)	(1.82)
Observations	70,521	70,521	70,521	70,521	70,521	70,617	70,617	70,617	70,617	70,617

(continued)

Table SOA-5. Continued.

	CAR[0,1]					CAR[2,60]				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
R-squared	0.092	0.090	0.083	0.112	0.105	0.028	0.028	0.028	0.093	0.093
Fama-MacBeth	No	No	No	Yes	Yes	No	No	No	Yes	Yes
Quarter FE	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No

Table SOA-6. Calendar-time Tests: Fama-MacBeth Regressions.

This table is the full version of Table 4 in the main paper. It presents results from Fama-MacBeth regressions (2003:5-2016:7). The dependent variable in all specifications is the monthly DGTW characteristic-adjusted stock return in month $t+1$. For the explanatory variables we use the most recent value as at the beginning of month $t+1$. The table further includes all the remaining variables from specification (6) of Table SOA-5, excluding size and book-to-market in quarter t. All variables are defined in Table SOA-1. All explanatory variables are standardized to have a zero mean and a standard deviation of one. The specifications include stocks with beginning of month prices above \$5. t-statistics, shown in parentheses, are based on standard errors accounting for heteroskedasticity and autocorrelation up to 12 months (Newey and West 1987).

	DGTW characteristic-adjusted stock return in month $t+1$		
	(1)	(2)	(3)
Negativity change in presentations	-0.035		
	(-1.93)		
Negativity change in answers	-0.055		
	(-2.76)		
Bleak tone change in presentations		-0.051	
		(-2.40)	
Bright tone change in presentations		-0.001	
		(-0.02)	
Bleak tone change in answers			-0.047
			(-1.88)
Bright tone change in answers			0.023
			(1.00)
Size in month t	-0.021	-0.022	-0.022
	(-0.42)	(-0.45)	(-0.43)
Book-to-market in month t	-0.055	-0.055	-0.054
	(-1.21)	(-1.20)	(-1.18)
Momentum	-0.060	-0.062	-0.061
	(-0.56)	(-0.57)	(-0.57)
Return Reversal	-0.185	-0.184	-0.182
	(-2.95)	(-2.93)	(-2.90)
Earnings surprise	0.046	0.047	0.048
	(1.58)	(1.66)	(1.66)
Earnings change in quarter t	0.065	0.065	0.064
	(1.75)	(1.78)	(1.73)
Negativity change in earnings press release	-0.023	-0.023	-0.030
	(-1.08)	(-1.11)	(-1.41)
Negativity change in analysts' questions	-0.056	-0.069	-0.056
	(-3.33)	(-4.03)	(-3.44)
Forecast dispersion before call	-0.030	-0.029	-0.029
	(-1.10)	(-1.08)	(-1.08)
Avg. N	1'339	1'339	1'339

(continued)

Table SOA-6. Continued.

	DGTW characteristic-adjusted stock return in month $t+1$		
	(1)	(2)	(3)
R-squared	0.025	0.072	0.072

Table SOA-7. How quickly do analysts respond? Forecast Error 7 Days Post-call.

This table presents panel and Fama-MacBeth regressions (2003:Q2-2016:Q2). The dependent variable in columns (1) to (5) is the analyst consensus forecast error, in percent of earnings in quarter $t+1$. The forecast error is based on the consensus forecast, outstanding 7 days after the conference call for quarter t. All variables are defined in Table SOA-1. Industry fixed effects (Industry FE) are based on the Fama-French 12 Industry classification. All explanatory variables are standardized to have a zero mean and a standard deviation of one. t-statistics are shown in parentheses. The underlying standard errors in the panel regressions are clustered on the firm level and are robust to heteroskedasticity, whereas the standard errors in the Fama-MacBeth regressions account for heteroskedasticity and autocorrelation up to 4 quarters.

	Consensus Forecast Error (7 days after quarter t call)				
	(1)	(2)	(3)	(4)	(5)
Negativity change in presentations	0.968				
	(4.26)				
Negativity change in answers	0.768				
	(3.26)				
Bleak tone change in presentations		0.770		1.140	
		(2.86)		(3.71)	
Bright tone change in presentations		-0.500		0.033	
		(-2.02)		(0.11)	
Bleak tone change in answers			0.211		0.469
			(0.80)		(1.75)
Bright tone change in answers			-0.836		-0.515
			(-3.33)		(-2.20)
Earnings change in quarter t	-3.193	-3.183	-3.233	-2.990	-3.015
	(-11.87)	(-11.83)	(-12.00)	(-6.92)	(-7.03)
Earnings surprise	-2.350	-2.363	-2.400	-4.615	-4.691
	(-6.28)	(-6.32)	(-6.40)	(-14.34)	(-14.33)
Negativity change in earnings press release	0.644	0.659	0.872	0.598	0.759
	(2.84)	(2.90)	(3.92)	(1.79)	(2.16)
Negativity change in analysts' questions	0.523	0.673	0.601	0.809	0.730
	(2.40)	(3.13)	(2.78)	(3.56)	(3.16)
Size in quarter t	12.550	12.587	12.661	-2.415	-2.438
	(11.09)	(11.12)	(11.18)	(-5.74)	(-5.81)
Book-to-market in quarter t	4.448	4.433	4.418	2.347	2.376
	(7.26)	(7.23)	(7.21)	(5.36)	(5.44)
Stock return in quarter t	-3.504	-3.526	-3.590	-2.996	-3.079
	(-11.20)	(-11.27)	(-11.50)	(-8.64)	(-8.74)
Monthly volatility in quarter t	-1.391	-1.385	-1.393	0.390	0.397
	(-2.58)	(-2.57)	(-2.58)	(1.00)	(1.03)
Pre-call forecast dispersion	-2.564	-2.569	-2.570	-1.448	-1.466
	(-6.27)	(-6.28)	(-6.28)	(-2.77)	(-2.79)
Ln(Words in the presentation)	0.793	0.818	0.780	0.442	0.336
	(1.81)	(1.87)	(1.78)	(1.45)	(1.18)

(continued)

Table SOA-7. Continued.

	Consensus Forecast Error (7 days after quarter t call)				
	(1)	(2)	(3)	(4)	(5)
Ln(Words in the answers)	-0.166	-0.144	-0.227	-0.518	-0.521
	(-0.34)	(-0.30)	(-0.47)	(-1.36)	(-1.41)
Ln(Words in the questions)	-0.017	-0.018	-0.031	-0.109	-0.115
	(-0.07)	(-0.07)	(-0.13)	(-0.30)	(-0.32)
Inconsistency in tone	-0.290	-0.142	-0.307	0.220	0.063
	(-1.21)	(-0.61)	(-1.28)	(0.91)	(0.26)
% Uncertain words	0.255	0.288	0.326	-0.195	-0.189
	(0.80)	(0.90)	(1.02)	(-0.79)	(-0.74)
% Strong modal words	0.630	0.608	0.615	0.607	0.624
	(2.46)	(2.37)	(2.40)	(3.08)	(3.13)
% Financial words	-1.405	-1.401	-1.382	-0.111	-0.116
	(-3.01)	(-3.01)	(-2.96)	(-0.32)	(-0.34)
% Atypical tense	-0.315	-0.289	-0.349	-1.129	-1.176
	(-0.79)	(-0.73)	(-0.88)	(-2.99)	(-2.99)
Complexity (words per sentence)	0.256	0.243	0.263	-0.136	-0.111
	(0.93)	(0.88)	(0.96)	(-0.60)	(-0.49)
% Numbers in total words	-1.298	-1.290	-1.280	-1.220	-1.211
	(-3.07)	(-3.05)	(-3.03)	(-4.94)	(-4.93)
Observations	70,796	70,796	70,796	70,796	70,796
R-squared	0.034	0.034	0.034	0.071	0.071
Fama-MacBeth	No	No	No	Yes	Yes
Quarter FE	Yes	Yes	Yes	No	No
Industry FE	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	No	No

Table SOA-8. Do Investors Respond to Managerial Negativity Changes? CAR[0,60].

This table presents panel and Fama-MacBeth regressions (2003:Q2-2016:Q2). The dependent variable in columns (1) to (5) is CAR[0,60]. All variables are defined in Table SOA-1. Industry fixed effects (Industry FE) are based on the Fama-French 12 Industry classification. All explanatory variables are standardized to have a zero mean and a standard deviation of one. t-statistics are shown in parentheses. The underlying standard errors in the panel regressions are clustered on the firm level and are robust to heteroskedasticity, whereas the standard errors in the Fama-MacBeth regressions account for heteroskedasticity and autocorrelation up to 4 quarters.

	CAR[0,60]				
	(1)	(2)	(3)	(4)	(5)
Negativity change in presentations	-0.913				
	(-13.72)				
Negativity change in answers	-0.431				
	(-6.73)				
Bleak tone change in presentations		-0.804		-0.870	
		(-11.07)		(-14.83)	
Bright tone change in presentations		0.346		0.399	
		(5.06)		(6.60)	
Bleak tone change in answers			-0.478		-0.538
			(-6.47)		(-10.15)
Bright tone change in answers			0.185		0.208
			(2.58)		(3.13)
Earnings change in quarter t	1.050	1.037	1.082	0.932	0.970
	(14.09)	(13.90)	(14.49)	(6.99)	(7.27)
Earnings surprise	1.201	1.209	1.246	1.319	1.363
	(11.78)	(11.85)	(12.15)	(10.04)	(10.31)
Negativity change in earnings press release	-0.344	-0.351	-0.554	-0.402	-0.613
	(-5.59)	(-5.71)	(-9.24)	(-6.12)	(-9.58)
Negativity change in analysts' questions	-0.764	-0.848	-0.834	-0.948	-0.930
	(-12.62)	(-14.07)	(-13.80)	(-12.27)	(-12.08)
Size in quarter t	-9.644	-9.672	-9.767	-0.188	-0.209
	(-24.67)	(-24.73)	(-24.89)	(-1.45)	(-1.56)
Book-to-market in quarter t	0.479	0.489	0.512	0.092	0.103
	(2.44)	(2.49)	(2.60)	(0.76)	(0.85)
Stock return in quarter t	-0.863	-0.856	-0.785	-0.600	-0.530
	(-9.23)	(-9.15)	(-8.41)	(-3.50)	(-3.13)
Monthly volatility in quarter t	0.332	0.325	0.333	0.037	0.032
	(2.24)	(2.19)	(2.25)	(0.14)	(0.12)
Pre-call forecast dispersion	0.062	0.066	0.067	0.006	0.012
	(0.68)	(0.74)	(0.74)	(0.07)	(0.15)
Ln(Words in the presentation)	-0.320	-0.351	-0.293	-0.138	-0.091
	(-2.52)	(-2.76)	(-2.31)	(-1.74)	(-1.11)
Ln(Words in the answers)	-0.071	-0.085	-0.088	-0.031	-0.044
	(-0.54)	(-0.65)	(-0.67)	(-0.28)	(-0.37)

(continued)

Table SOA-8. Continued.

	CAR[0,60]				
	(1)	(2)	(3)	(4)	(5)
Ln(Words in the questions)	0.013 (0.19)	0.014 (0.19)	0.026 (0.37)	0.074 (1.12)	0.094 (1.42)
Inconsistency in tone	-0.066 (-1.00)	-0.141 (-2.18)	0.022 (0.33)	-0.083 (-1.36)	0.074 (1.14)
% Uncertain words	-0.058 (-0.62)	-0.071 (-0.76)	-0.119 (-1.26)	-0.042 (-0.46)	-0.073 (-0.84)
% Strong modal words	0.069 (0.92)	0.083 (1.11)	0.078 (1.03)	-0.002 (-0.03)	-0.004 (-0.07)
% Financial words	-0.003 (-0.02)	-0.008 (-0.06)	-0.028 (-0.22)	0.070 (0.74)	0.066 (0.66)
% Atypical tense	-0.154 (-1.45)	-0.168 (-1.59)	-0.128 (-1.21)	0.011 (0.15)	0.045 (0.57)
Complexity (words per sentence)	-0.273 (-3.36)	-0.265 (-3.27)	-0.280 (-3.44)	-0.185 (-3.36)	-0.195 (-3.59)
% Numbers in total words	0.591 (4.95)	0.585 (4.90)	0.574 (4.80)	0.286 (3.59)	0.271 (3.33)
Observations	70,632	70,632	70,632	70,632	70,632
R-squared	0.056	0.055	0.053	0.107	0.104
Fama-MacBeth	No	No	No	Yes	Yes
Quarter FE	Yes	Yes	Yes	No	No
Industry FE	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	No	No

Table SOA-9. Calendar-time Tests: Conditional Abnormal Returns to Negativity Changes.

This table presents abnormal returns to a conference call trading strategy, conditional on firm characteristics (2003:5-2016:7). In the beginning of each month, stocks are sorted into terciles based on a given characteristic. Then within each characteristic group, stocks are further ranked into quintile portfolios based on their most recent quarter-to-quarter change in negativity. The reported statistics in each characteristic group are mean returns of the portfolio which is long (short) low (high) negativity changes stocks. The strategy is rebalanced monthly and only stocks with beginning of month prices above $5 are included. *t*-statistics are shown in parentheses. The underlying standard errors account for heteroskedasticity and autocorrelation up to 12 months.

Panel A. Long-short returns to negativity change in presentations

	Market Cap	Institutional Ownership	Number of Analysts	Absolute Surprise
1 (Low)	0.642	0.609	0.446	0.057
	(4.96)	(3.93)	(3.54)	(0.44)
2	0.367	0.128	0.351	0.083
	(2.68)	(0.78)	(2.63)	(0.83)
3 (High)	-0.030	0.249	0.016	0.636
	(-0.32)	(1.93)	(0.15)	(4.91)
3-1	-0.672	-0.360	-0.430	0.579
	(-6.38)	(-2.17)	(-3.39)	(3.56)

Panel B. Long-short returns to negativity change in answers

	Market Cap	Institutional Ownership	Number of Analysts	Absolute Surprise
1 (Low)	0.578	0.481	0.156	0.043
	(4.68)	(4.43)	(1.15)	(0.47)
2	0.157	-0.027	0.361	0.021
	(1.90)	(-0.27)	(2.91)	(0.22)
3 (High)	-0.086	0.108	0.080	0.570
	(-0.97)	(1.08)	(0.66)	(3.84)
3-1	-0.664	-0.373	-0.076	0.527
	(-5.01)	(-2.68)	(-0.36)	(2.76)

Table SOA-10. Sample Splits.

This table presents panel regressions within subsamples (2003:Q2-2016:Q2). In Panel A, the sample is split based on terciles of industry guidance. Industry guidance is defined as the percentage of firms in a given industry that have provided quantitative earnings guidance over the elapsed quarter, where High (Low) is the high (low) guidance tercile. In Panel B, the sample is split based on terciles of the absolute mean earnings surprise, where High (Low) is the high (low) surprise tercile. We run regressions similar to those in column (1) and (4) of Tables 1, 2, and 3 of the main text, respectively. All variables are defined in Table SOA-1. All explanatory variables are standardized to have a zero mean and a standard deviation of one. t-statistics are shown in parentheses. The underlying standard errors in the panel regressions are clustered on the firm level and are robust to heteroskedasticity.

Panel A. Sample splits by terciles of industry earnings guidance

	Earnings Change in quarter $t+1$		Post-call Forecast Dispersion		Consensus Forecast Change		CAR[0,60]	
	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.
Low	-0.010	0.001	0.588	-0.121	-1.046	-0.219	-0.378	-0.284
	(-1.38)	(0.17)	(1.94)	(-0.40)	(-4.82)	(-1.13)	(-3.24)	(-2.64)
High	-0.029	-0.012	0.963	0.138	-2.424	-0.807	-0.996	-0.607
	(-5.21)	(-2.22)	(3.74)	(0.52)	(-11.51)	(-3.86)	(-10.08)	(-6.32)

Panel B. Sample splits by terciles of the absolute mean earnings surprise

	Earnings Change in quarter $t+1$		Post-call Forecast Dispersion		Consensus Forecast Change		CAR[0,60]	
	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.
Low	-0.011	-0.014	0.496	-0.111	-0.832	-0.279	-0.472	-0.274
	(-1.65)	(-2.27)	(3.10)	(-0.67)	(-5.72)	(-1.85)	(-4.73)	(-2.86)
High	-0.042	-0.011	1.198	0.216	-3.248	-0.736	-1.466	-0.449
	(-5.96)	(-1.64)	(2.82)	(0.53)	(-10.81)	(-2.52)	(-10.51)	(-3.34)

Table SOA-11. Interaction Effects.

This table presents panel regressions with interaction effects (2003:Q2-2016:Q2). In Panel A, negativity changes are interacted with terciles of industry guidance. Industry guidance is defined as the percentage of firms in given industry that provide quantitative earnings guidance. In Panel B, negativity changes are interacted with terciles of the absolute mean earnings surprise. We run regressions similar to those in columns (2), (3), (4), (5) of Tables 1, 2, and 3 of the main text, respectively. The only difference is that here we focus on interaction effects rather than bright/ bleak tone changes. In Panel A, we further omit the industry fixed-effects. All variables are defined in Table SOA-1. t-statistics are shown in parentheses. The underlying standard errors in the panel regressions are clustered on the firm level and are robust to heteroskedasticity.

Panel A. Interactions with guidance

	Earnings Change in quarter $t+1$		Post-call Forecast Dispersion		Consensus Forecast Change		CAR[0,60]	
	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.
Ex. Neg. (A)	0.016	0.009	0.493	-0.122	0.374	0.505	-0.124	0.117
	(1.57)	(0.89)	(1.18)	(-0.29)	(1.15)	(1.70)	(-0.74)	(0.74)
Ind. Guidance (B)	0.093	0.098	-19.339	-19.565	-16.980	-16.458	-3.178	-2.922
	(0.36)	(0.37)	(-1.24)	(-1.25)	(-3.05)	(-2.86)	(-0.91)	(-0.85)
(A)x(B)	-0.018	-0.011	0.157	0.160	-1.083	-0.676	-0.398	-0.334
	(-4.16)	(-2.48)	(0.85)	(0.83)	(-7.09)	(-4.65)	(-5.46)	(-4.66)

Panel B. Interactions with absolute mean earnings surprise

	Earnings Change in quarter $t+1$		Post-call Forecast Dispersion		Consensus Forecast Change		CAR[0,60]	
	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.
Ex. Neg. (A)	-0.005	-0.014	0.354	-0.437	0.991	0.098	-0.083	-0.232
	(-0.56)	(-1.54)	(1.01)	(-1.15)	(3.45)	(0.33)	(-0.54)	(-1.41)
Abs. Surp. (B)	-0.003	-0.002	2.547	2.532	-0.238	-0.238	1.258	1.268
	(-0.45)	(-0.42)	(9.78)	(9.71)	(-1.15)	(-1.15)	(12.44)	(12.51)
(A)x(B)	-0.009	0.000	0.259	0.335	-1.514	-0.513	-0.454	-0.177
	(-2.03)	(0.02)	(1.20)	(1.49)	(-9.13)	(-3.01)	(-5.62)	(-2.11)

Table SOA-12. Additional Tests.

This table presents additional tests to the main analysis. We run regressions similar to those in columns (2), (3), (4), (5) of Tables 1, 2, and 3 but perform certain changes. The respective alterations are described in the header of each panel. For the baseline specification see the respective table. Bleak (Bright) abbreviates bleak tone changes (bright tone changes), whereas Pres. (Ans.) abbreviates presentation (answers). All explanatory variables are standardized to have a zero mean and a standard deviation of one. t-statistics are shown in parentheses. The underlying standard errors in the panel regressions are clustered on the firm level and are robust to heteroskedasticity.

Panel A. Redefine negativity changes as negativity minus average negativity during the prior four quarters

	Earnings Change in quarter $t+1$		Post-call Forecast Dispersion		Consensus Forecast Change		Consensus Forecast Error		CAR[0,1]		CAR[2,60]	
	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.
Bleak	-0.048	-0.033	0.728	0.850	-2.016	-1.318	1.221	0.749	-0.551	-0.452	-0.041	-0.015
	(-10.07)	(-6.90)	(3.52)	(3.81)	(-11.22)	(-7.33)	(3.97)	(2.40)	(-15.77)	(-12.54)	(-0.55)	(-0.21)
Bright	0.037	0.012	-0.390	0.140	1.061	0.414	-0.984	-0.814	0.317	0.091	0.111	0.124
	(8.75)	(2.72)	(-2.12)	(0.81)	(7.38)	(2.92)	(-3.56)	(-3.09)	(10.03)	(2.93)	(1.65)	(1.86)

Panel B. Use negative/words (instead of (negative-positive)/(negative+positive+1))

	Earnings Change in quarter $t+1$		Post-call Forecast Dispersion		Consensus Forecast Change		Consensus Forecast Error		CAR[0,1]		CAR[2,60]	
	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.
Bleak	-0.030	-0.017	1.071	0.381	-1.960	-0.621	1.365	0.670	-0.549	-0.377	-0.155	-0.065
	(-7.08)	(-4.11)	(5.47)	(1.97)	(-12.59)	(-4.06)	(4.63)	(2.44)	(-16.96)	(-12.17)	(-2.32)	(-0.94)
Bright	-0.004	-0.001	0.010	0.201	0.333	0.383	-0.239	-0.346	0.298	0.040	-0.017	-0.020
	(-1.01)	(-0.31)	(0.06)	(1.06)	(2.60)	(2.88)	(-0.92)	(-1.32)	(9.76)	(1.34)	(-0.27)	(-0.31)

(continued)

Table SOA-12. Continued.

Panel C. Restrict sample to the period up to Q4 2007

	Earnings Change in quarter $t+1$		Post-call Forecast Dispersion		Consensus Forecast Change		Consensus Forecast Error		CAR[0,1]		CAR[2,60]	
	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.
Bleak	-0.022	-0.026	0.997	0.504	-1.663	-0.946	0.835	0.251	-0.402	-0.409	-0.158	-0.118
	(-3.00)	(-3.31)	(2.94)	(1.59)	(-6.22)	(-3.64)	(1.76)	(0.54)	(-7.35)	(-7.39)	(-1.46)	(-0.99)
Bright	-0.005	-0.007	0.143	0.050	0.194	-0.014	-0.619	-1.160	0.239	0.059	-0.013	-0.029
	(-0.73)	(-0.99)	(0.46)	(0.17)	(0.87)	(-0.06)	(-1.42)	(-2.66)	(4.81)	(1.17)	(-0.11)	(-0.25)

Panel D. Split sample by executive incentives (delta) into terciles and re-run analyses within high delta sample

	Earnings Change in quarter $t+1$		Post-call Forecast Dispersion		Consensus Forecast Change		Consensus Forecast Error		CAR[0,1]		CAR[2,60]	
	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.
Bleak	-0.019	-0.027	0.485	0.740	-1.212	-0.725	0.248	0.964	-0.417	-0.441	-0.097	-0.006
	(-2.16)	(-3.08)	(1.98)	(2.57)	(-4.35)	(-3.02)	(0.52)	(2.16)	(-6.66)	(-7.08)	(-0.78)	(-0.05)
Bright	-0.007	-0.007	-0.157	0.326	0.439	-0.105	-0.767	-0.028	0.326	0.025	0.026	0.065
	(-0.82)	(-0.89)	(-0.65)	(1.37)	(2.03)	(-0.44)	(-1.94)	(-0.07)	(5.68)	(0.44)	(0.22)	(0.58)

Table SOA-13. Additional Robustness.

This table presents additional robustness to the main analysis. We run regressions similar to those in columns (2), (3), (4), (5) of Tables 1, 2, and 3 of the main text but perform certain changes. The respective alterations are described in the header of each panel. For the baseline specification see the respective table. Bleak (Bright) abbreviates bleak tone change (bright tone change), whereas Pres. (Ans.) abbreviates presentation (answers). All explanatory variables are standardized to have a zero mean and a standard deviation of one. t-statistics are shown in parentheses. The underlying standard errors in the panel regressions are clustered on the firm level and are robust to heteroskedasticity.

Panel A. Remove "question" and "questions" from the list of negative words

	Earnings Change in quarter $t+1$		Post-call Forecast Dispersion		Consensus Forecast Change		Consensus Forecast Error		CAR[0,1]		CAR[2,60]	
	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.
Bleak	-0.028	-0.022	0.873	0.399	-1.768	-0.849	0.938	0.419	-0.528	-0.436	-0.136	-0.049
	(-6.74)	(-5.20)	(4.58)	(2.08)	(-11.44)	(-5.80)	(3.37)	(1.55)	(-16.63)	(-14.07)	(-2.03)	(-0.75)
Bright	-0.000	-0.006	-0.103	0.212	0.527	0.068	-0.603	-0.556	0.322	0.023	-0.030	0.060
	(-0.06)	(-1.45)	(-0.61)	(1.16)	(4.19)	(0.51)	(-2.39)	(-2.09)	(10.88)	(0.80)	(-0.49)	(0.91)

Panel B. Keep only observations where call date = earnings announcement date

	Earnings Change in quarter $t+1$		Post-call Forecast Dispersion		Consensus Forecast Change		Consensus Forecast Error		CAR[0,1]		CAR[2,60]	
	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.
Bleak	-0.028	-0.020	0.990	0.275	-1.830	-0.857	1.241	0.277	-0.554	-0.431	-0.157	-0.016
	(-6.01)	(-4.18)	(4.40)	(1.19)	(-10.08)	(-5.00)	(3.84)	(0.92)	(-15.14)	(-11.74)	(-2.07)	(-0.21)
Bright	0.000	-0.005	0.069	0.019	0.464	0.179	-0.524	-0.940	0.339	0.073	-0.035	0.177
	(0.03)	(-1.06)	(0.34)	(0.09)	(3.16)	(1.16)	(-1.86)	(-3.35)	(9.62)	(2.16)	(-0.48)	(2.34)

(continued)

Table SOA-13. Continued.

Panel C. Industry-quarter fixed effects (instead of industry & quarter fixed effects)

	Earnings Change in quarter $t+1$		Post-call Forecast Dispersion		Consensus Forecast Change		Consensus Forecast Error		CAR[0,1]		CAR[2,60]	
	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.
Bleak	-0.026	-0.019	0.877	0.415	-1.666	-0.784	0.854	0.342	-0.546	-0.435	-0.136	-0.028
	(-6.33)	(-4.60)	(4.61)	(2.10)	(-10.93)	(-5.39)	(3.11)	(1.29)	(-17.00)	(-13.78)	(-2.10)	(-0.43)
Bright	-0.002	-0.004	-0.045	0.189	0.567	0.219	-0.525	-0.767	0.353	0.059	-0.027	0.119
	(-0.46)	(-1.02)	(-0.26)	(1.02)	(4.48)	(1.67)	(-2.11)	(-2.99)	(11.82)	(1.99)	(-0.45)	(1.86)

Panel D. CEO tone surprises & CEO fixed effects (instead of firm tone surprises & firm fixed effects)

	Earnings Change in quarter $t+1$		Post-call Forecast Dispersion		Consensus Forecast Change		Consensus Forecast Error		CAR[0,1]		CAR[2,60]	
	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.
Bleak	-0.025	-0.011	0.650	0.746	-1.617	-0.691	0.841	0.066	-0.500	-0.293	-0.178	0.005
	(-5.40)	(-2.42)	(3.31)	(3.47)	(-9.63)	(-4.16)	(2.84)	(0.21)	(-14.44)	(-7.95)	(-2.48)	(0.06)
Bright	-0.007	0.004	0.188	0.376	0.172	0.058	-0.214	-0.398	0.194	0.124	-0.059	0.096
	(-1.62)	(1.01)	(0.97)	(1.91)	(1.16)	(0.37)	(-0.77)	(-1.35)	(5.73)	(3.74)	(-0.85)	(1.35)

Panel E. Delete observations with prices below \$5

	Earnings Change in quarter $t+1$		Post-call Forecast Dispersion		Consensus Forecast Change		Consensus Forecast Error		CAR[0,1]		CAR[2,60]	
	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.
Bleak	-0.027	-0.019	0.849	0.348	-1.674	-0.870	0.683	0.271	-0.549	-0.434	-0.130	-0.059
	(-6.47)	(-4.38)	(4.59)	(1.84)	(-10.88)	(-6.24)	(2.51)	(1.02)	(-16.97)	(-13.65)	(-1.99)	(-0.90)
Bright	-0.003	-0.003	-0.063	0.098	0.410	0.181	-0.435	-0.665	0.322	0.070	-0.047	0.088
	(-0.79)	(-0.71)	(-0.38)	(0.56)	(3.28)	(1.42)	(-1.74)	(-2.56)	(10.72)	(2.36)	(-0.75)	(1.39)

(continued)

Table SOA-13. Continued.

Panel F. Double cluster standard errors

	Earnings Change in quarter $t+1$		Post-call Forecast Dispersion		Consensus Forecast Change		Consensus Forecast Error		CAR[0,1]		CAR[2,60]	
	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.
Bleak	-0.028	-0.019	0.886	0.443	-1.744	-0.821	0.930	0.352	-0.548	-0.438	-0.165	-0.030
	(-6.35)	(-4.42)	(4.39)	(2.48)	(-10.63)	(-5.80)	(3.10)	(1.32)	(-15.08)	(-13.67)	(-2.58)	(-0.40)
Bright	-0.001	-0.003	-0.085	0.188	0.545	0.216	-0.559	-0.776	0.338	0.057	-0.029	0.110
	(-0.25)	(-0.81)	(-0.42)	(0.88)	(3.59)	(1.90)	(-2.30)	(-3.30)	(10.35)	(1.89)	(-0.43)	(1.68)

Panel G. Allow for bleak and bright tone changes in questions and earnings press releases

	Earnings Change in quarter $t+1$		Post-call Forecast Dispersion		Consensus Forecast Change		Consensus Forecast Error		CAR[0,1]		CAR[2,60]	
	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.	Pres.	Ans.
Bleak	-0.027	-0.019	0.881	0.440	-1.722	-0.807	0.902	0.342	-0.552	-0.434	-0.161	-0.024
	(-6.70)	(-4.50)	(4.60)	(2.23)	(-11.25)	(-5.53)	(3.26)	(1.29)	(-17.26)	(-13.80)	(-2.41)	(-0.36)
Bright	-0.001	-0.003	-0.089	0.186	0.562	0.229	-0.581	-0.784	0.335	0.060	-0.026	0.115
	(-0.22)	(-0.66)	(-0.51)	(1.01)	(4.47)	(1.74)	(-2.32)	(-3.04)	(11.23)	(2.04)	(-0.42)	(1.76)